Vol. 1000 Number 2

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

November 11, 1980

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DEPARTMENT
OF COMMERCE

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT consult the notice entitled "update of information concerning the Patent Cooperation Treaty" appearing in the OFFICIAL GAZETTE of July 15, 1980.

Note that since August 1, 1979 certain fees for the processing of International Applications have been increased. The current schedule of fees is as follows:

Transmittal fee	$35.00
Search fee	300.00
Basic fee (first 30 pages)	190.00
Basic fee supplement (each sheet over 30)	3.50
Designation fee	45.00

June 17, 1980.

SIDNEY A. DIAMOND,
Commissioner of Patents and Trademarks.

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,521,588, Re. S.N. 178,774, Filed Aug. 18, 1980, Cl. 114/263, MOVABLE FLOATING BOAT ANCHORAGE, Gerald D. Atlas, Owner of Record: *Paragon Pool Enterprises, Wheeling, Ill.,* Attorney or Agent: Allen H. Gerstein, Ex. Gp.: 315

3,772,589, Re. S.N. 177,560, Filed Aug. 13, 1980, Cl. 324/10, APPARATUS FOR DETERMINING THE RESISTIVITY OF A SUBSURFACE EARTH FORMATION AT DIFFERENT LATERAL DISTANCES FROM A BORE HOLE WALL, Andre Scholberg, Owner of Record: *Schlumberger Technology Corporation, New York, N.Y.,* Attorney or Agent: Stephen L. Borst, et al., Ex. Gp.: 252

3,902,898, Re. S.N. 162,122, Filed Jun. 23, 1980, Cl. 75/128 P, FREE-MACHINING AUSTENITIC STAINLESS STEEL, Elbert E. Denhard, Jr., et al., Owner of Record: *Armco Inc., Middletown, Ohio,* Attorney or Agent: Albert E. Strasser, et al., Ex. Gp.: 111

3,924,653, Re. S.N. 167,045, Filed Jul. 9, 1980, Cl. 137/236, DEVICE FOR TEMPORARY STORAGE OF WASTE AND STORM WATER, Stein Bendixen, Owner of Record: *Inventor,* Attorney or Agent: Charles E. Brown, et al., Ex. Gp.: 341

3,987,784, Re. S.N. 177,619, Filed Aug. 13, 1980, Cl. 126/447, SOLAR ENERGY ABSORBER PANEL, Joseph A. Godrick, Owner of Record: *Kennecott Copper Corporation, New York, N.Y.,* Attorney or Agent: Harold D. Jones, et al., Ex. Gp.: 345

4,018,944, Re. S.N. 182,031, Filed Aug. 28, 1980, Cl. 427/140, METHOD OF APPLYING A WEARING SURFACE, James R. Hallstrom, et al., Owner of Record: *Rexnord Inc., Milwaukee, Wis.,* Attorney or Agent: James B. Kinzer, et al., Ex. Gp.: 162

4,105,391, Re. S.N. 176,260, Filed Aug. 7, 1980, Cl. 425/526, INJECTION BLOW MOLDING MACHINE, Katashi Aoki, Owner of Record: *Nissei ASB Machine Co., Ltd., Tokyo, Japan,* Attorney or Agent: Carl Kustin, et al., Ex. Gp.: 147

4,107,715, Re. S.N. 177,614, Filed Aug. 13, 1980, Cl. 354/206, FILMSTRIP METERING DEVICE FOR A CAMERA, Harumi Tanaka, Owner of Record: *Minolta Camera Kabushiki Kaisha, Osaka, Japan,* Attorney or Agent: Lawrence R. Radanovic, Ex. Gp.: 211

4,109,829, Re. S.N. 182,783, Filed Aug. 29, 1980, Cl. 222/81, CONTAINER FOR METERED DISPENSING OF LIQUID, Alexander Kuckens, et al., Owner of Record: *Dagma Deutsche Automaten- und Getrankemaschinen-Gesellschaft mit Beschrankter Haftung & Co., Reinfeld, Germany,* Attorney or Agent: Dale R. Small, Ex. Gp.: 311

4,110,795, Re. S.N. 181,610, Filed Aug. 27, 1980, Cl. 358/260, METHOD OF GRAPHIC DATA REDUNDANCY REDUCTION IN AN OPTICAL FACSIMILE SYSTEM, David R. Spencer, Owner of Record: *Litton Systems, Inc., Melville, N.Y.,* Attorney or Agent: Robert F. Rotella, et al., Ex. Gp.: 233

4,117,405, Re. S.N. 180,501, Filed Aug. 22, 1980, Cl. 455/51, NARROW-BAND RADIO COMMUNICATION SYSTEM, Louis Martinez, Owner of Record: *Inventor,* Attorney or Agent: Roger W. Blakely, et al., Ex. Gp.: 233

4,140,900, Re. S.N. 182,694, Filed Aug. 29, 1980, Cl. 250/213 VT, PANEL TYPE X-RAY IMAGE INTENSIFIER TUBE AND RADIOGRAPHIC CAMERA SYSTEM, Shih-Ping Wang, Owner of Record: *Diagnostic Information, Inc., Sunnyvale, Calif.,* Attorney or Agent: Karl A. Limbach, et al., Ex. Gp.: 252

4,157,173, Re. S.N. 178,835, Filed Aug. 18, 1980, Cl. 267/110, SEAT BASE RAIL CONNECTOR AND ASSEMBLY, Lawton H. Crosby, Owner of Record: *Morley Furniture Spring Corporation, Chicago, Ill.,* Attorney or Agent: James P. Hume, et al., Ex. Gp.: 311

4,166,290, Re. S.N. 177,555, Filed Aug. 13, 1980, Cl. 364/200, COMPUTER MONITORING SYSTEM, Eugene L. Furtman, et al., Owner of Record: *Tesdata Systems Corporation, McLean, Va.,* Attorney or Agent: Richard C. Sughrue, et al., Ex. Gp.: 237

4,166,547, Re. S.N. 177,718, Filed Aug. 11, 1980, Cl. 220/339, TIDY BOX MADE ENTIRELY OF POLYPROPYLENE, Renato Castelli, Owner of Record: *Inventor,* Attorney or Agent: George J. Netter, Ex. Gp.: 241

4,198,398, Re. S.N. 178,345, Filed Aug. 14, 1980, Cl. 424/177, ENKEPHALIN ANALOGUES, Derek Hudson, Owner of Record: *Derek Hudson, et al.,* Attorney or Agent: Thomas P. Sarro, Ex. Gp.: 125

PATENT NOTICES

Certificates of Correction for the Week of Nov. 11, 1980

D. 253,296	4,186,350	4,209,431	4,214,246
D. 255,024	4,186,610	4,209,583	4,214,249
D. 256,403	4,187,705	4,209,598	4,214,337
3,947,810	4,188,743	4,210,220	4,214,481
3,981,283	4,189,222	4,210,238	4,214,509
3,983,027	4,190,598	4,210,288	4,214,559
4,003,023	4,192,921	4,210,360	4,214,579
4,005,077	4,194,704	4,210,423	4,215,071
4,032,543	4,195,850	4,210,702	4,215,077
4,046,319	4,197,436	4,210,837	4,215,195
4,047,607	4,197,505	4,211,012	4,215,415
4,047,804	4,198,431	4,211,097	4,215,607
4,048,058	4,198,496	4,211,277	4,215,668
4,049,248	4,200,443	4,211,431	4,215,780
4,067,067	4,201,712	4,211,711	4,216,378
4,072,396	4,201,788	4,211,736	4,216,398
4,075,059	4,201,843	4,211,759	4,216,435
4,104,488	4,202,064	4,212,111	4,216,494
4,111,869	4,203,706	4,212,119	4,216,554
4,122,304	4,204,062	4,212,307	4,216,561
4,134,740	4,204,208	4,212,317	4,216,714
4,138,268	4,204,264	4,212,333	4,216,764
4,138,854	4,204,664	4,212,420	4,216,772
4,141,886	4,204,894	4,212,564	4,217,078
4,156,088	4,206,101	4,212,789	4,217,176
4,161,031	4,206,267	4,212,896	4,217,202
4,161,812	4,206,490	4,212,952	4,217,440
4,162,130	4,206,541	4,212,969	4,217,679
4,162,492	4,207,137	4,212,990	4,217,748
4,165,371	4,207,142	4,213,036	4,218,452
4,169,011	4,207,529	4,213,187	4,218,751
4,172,802	4,208,215	4,213,403	4,218,813
4,173,417	4,208,290	4,213,518	4,219,449
4,180,931	4,208,295	4,213,613	4,219,532
4,181,403	4,208,679	4,213,650	4,220,174
4,184,042	4,209,157	4,213,719	4,220,200
4,184,203	4,209,306	4,213,912	4,221,365
4,185,806	4,209,391	4,213,984	4,221,865
4,186,311	4,209,415	4,213,995	4,222,481
		4,214,009	4,230,480

Disclaimer and Dedication

4,155,453.—*Dan D. Ono*, San Francisco, Calif. INFLATABLE GRIP CONTAINER. Patent dated May 22, 1979. Disclaimer and Dedication filed Aug. 11, 1980, by the inventor.

Hereby disclaims and dedicates all claims of said patent.

Disclaimer

4,089,930.—*James R. Kittrell*, Amherst, Mass. and *Donald L. Herman*, Yardley, Pa. PROCESS FOR THE CATALYTIC REDUCTION OF NITRIC OXIDE. Patent dated May 16, 1978. Disclaimer filed Feb. 29, 1980, by the assignee, *New England Power Service Company*.

The term of this patent subsequent to Mar. 21, 1995, has been disclaimed.

National Technical Information Service

GOVERNMENT-OWNED INVENTIONS

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DOUGLAS J. CAMPION,
Program Coordinator,
Office of Government Inventions and Patents,
National Technical Information Service,
U.S. Department of Commerce.

U.S. DEPARTMENT OF AGRICULTURE

Program Agreements and Patent Branch, Administration Service Division, Federal Bldg., Science and Education Administration, Hyattsville, Md. 20782

Patent application 6–124,011. Protection of Insect Pheromones From Degradation by Ultraviolet Radiation. Filed Feb. 25, 1980.

Patent application 6–124,012. Protection of Insect Pheromones From Degradation by Ultraviolet Radiation. Filed Feb. 25, 1980.

Patent application 6–128,440. Process for the Preparation of Tris(aminomethyl)phosphine Oxide and Its Ternary Salts. Filed Mar. 10, 1980.

Patent application 6–132,594. Method of Imparting Smolder Resistance to Cotton-Containing Textiles. Filed Mar. 21, 1980.

Patent application 6–134,014. Compositions and Processes for Producing Flame Retardant Textile Materials Based on Methylolaminotrihalopropyl Triazines and Antimony Oxides. Filed Mar. 26, 1980.

Patent 4,194,032. Transfer Techniques for Producing Flame Retardant Cotton Fabrics. Filed Mar. 5, 1975. Patented Mar. 18, 1980. Not available NTIS.

Patent 4,196,302. Quaternary Phosphonium Salts Bearing Carbamate Groups. Filed Mar. 6, 1979. Patented Apr. 1, 1980. Not available NTIS.

Patent 4,199,460. Fatty Acid-Derived Lubricants and Additives. Filed Sept. 26, 1978. Patented Apr. 22, 1980. Not available NTIS.

Patent 4,201,709. Process for Producing a Low Gossypol Protein Product From Glanded Cottonseed. Filed May 26, 1978. Patented May 6, 1980. Not available NTIS.

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These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

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	Sacramento: California State Library	(916) 322-4572
	Sunnyvale: Patent Information Clearinghouse*	(408) 738-5580
Colorado	Denver Public Library	(303) 573-5152 Ext. 223
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	St. Louis Public Library	(314) 241-2288 Ext. 214
Nebraska	Lincoln: University of Nebraska-Lincoln, Love Library	(402) 472-3411
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7740
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 790-6291
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Public Library of Cincinnati & Hamilton County	(513) 369-6936
	Cleveland Public Library	(216) 623-2932
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1224**
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 224
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 528-2957
Texas	Dallas Public Library	(214) 748-9071
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

**Call only between the hours of 12 o'clock noon and 5 :00 p.m.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF SEPTEMBER 6, 1980

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—D. E. TALBERT, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy: Metallurgical Apparatus: Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	10-25-79
GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director. Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	5-11-79
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthodontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	5-7-79
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director. Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	11-27-79
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	7-11-79
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—Vacant. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	12-11-78
SPECIAL LAWS ADMINISTRATION, GROUP 220—Vacant. Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy; Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.	4-16-79
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—Vacant. Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	8-13-79
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director. Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling.	1-22-79
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	11-30-78
DESIGNS, GROUP 290—Vacant. Industrial Arts; Household, Personal and Fine Arts.	10-10-78
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	7-2-79
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—M. M. NEWMAN, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	6-4-79
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. AEGERTER, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	7-30-80
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	4-24-79
GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—G. M. FORLENZA, Director. Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Misc. Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.	3-19-79

Expiration of patents: The patents within the range of numbers indicated below expire during September 1980, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,102,270 to 3,105,236, inclusive
Plant Patents ..... Numbers 2,277 to 2,286, inclusive

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FEDDEMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF SEPTEMBER 4, 1998

REISSUES

NOVEMBER 11, 1980

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 30,432
STRUCTURAL ASSEMBLIES

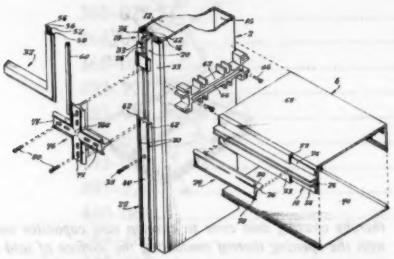
Richard L. Stoakes, "Clouds", Northdown Rd., Woldingham, Surrey, England

Original No. 3,940,897, dated Mar. 2, 1976, Ser. No. 430,036, Jan. 2, 1974. Application for reissue Feb. 21, 1978, Ser. No. 879,797

Claims priority, application United Kingdom, Jan. 10, 1973, 1285/73

Int. Cl.[2] **E04B** *2/88, 1/00*

U.S. Cl. 52—395 **14 Claims**



13. A glazing structure comprising an elongated structural member having two spaced apart surfaces to abut against, with or without the interposition of gaskets, the one faces of two panel edge portions respectively, a glazing bead of open channel section whereof the channel base is arranged to engage the structural member between the said surfaces with the side walls of the channel extending outwardly away from the structural member, the side walls being turned outwardly from one another at their end portions to provide abutments facing towards the surfaces to lie opposite the other faces of the edge portions of the panels respectively, means accessible from the outer side of the channel section of the glazing bead to secure the base of the channel of the bead to the structural member and two gaskets of elastomeric material each having a first portion to lie between the abutment and the other faces and second portions to enter within the channel of the glazing bead, the arrangement being such that the glazing bead can first be secured to the structural member with the first portions of the gaskets secured between the bead and the panels to hold the panels in position and the second portions can then be pressed side by side in the channel to form a weatherproof seal for the channel.

Re. 30,433
HEAT EXCHANGER

Rudy C. Bussjager, Syracuse, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Original No. 4,057,976, dated Nov. 15, 1977, Ser. No. 720,722, Sep. 7, 1976. Application for reissue Jan. 5, 1979, Ser. No. 1,324

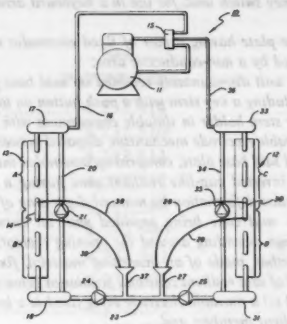
Int. Cl.[2] **F25B** *1/00, 13/00;* **F28F** *27/02*

U.S. Cl. 62—115 **3 Claims**

10. A method of routing refrigerant through a heat exchanger arranged to serve as a condenser when the flow of refrigerant to the exchanger is in one direction and as an evaporator when the flow to the exchanger is in the opposite direction, the steps including

dividing the heat exchanger into a plurality of heat transfer zones arranged so that when air flows through the heat exchanger, the air flows through the zones in parallel paths,

directing refrigerant in a series flow progression through each of the heat transfer zones when the flow to the exchanger is in one direction, and



rerouting the refrigerant through each of the heat transfer zones simultaneously when the flow to the exchanger is in the opposite direction.

Re. 30,434
ELECTROLESS TIN AND TIN-LEAD ALLOY PLATING BATHS

Thomas F. Davis, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Original No. 4,093,466, dated Jun. 6, 1978, Ser. No. 574,979, May 6, 1975. Application for reissue Dec. 21, 1978, Ser. No. 972,088

The portion of the term of this patent subsequent to Oct. 11, 1994, has been disclaimed.

Int. Cl.[3] **C23C** *3/02*

U.S. Cl. 106—1.22 **9 Claims**

1. A salt composition, when diluted with 1 liter of water and sufficient hydrochloric acid to provide a solution having a pH of 0.5 to 1, is suitable for immersion plating [tin-lead alloys] *essentially tin* at increased rates, the salt composition [comprising] *consisting essentially of* the proportions of:

a.	hydrous stannous chloride ($SnCl_2 . 2H_2O$)	from about 10 to about 150 g,
b.	lead chloride ($PbCl_2$)	from about 1 to about 12 g,
c.	sodium hypophosphite ($NaH_2PO_2 . H_2O$)	from about 10 to about 100 g, and
d.	thiourea ($NH_2 . CS . NH_2$)	from about [15] *40* about 100 g,

Re. 30,435

KEYBOARD SWITCH ARRANGEMENT AND KEY SWITCH USEABLE THEREIN

Satoshi Fukao, Kasugai, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Japan

Original No. 3,900,712, dated Aug. 19, 1975, Ser. No. 434,591, Jan. 18, 1974. Application for reissue Aug. 15, 1977, Ser. No. 825,540

Claims priority, application Japan, Feb. 23, 1973, 48-22564

Int. Cl.[2] H01H *13/04;* B41J *5/08;* H01H *9/02*

U.S. Cl. 200—159 R 8 Claims

9. A key switch unit, for use in a keyboard arrangement, comprising:

a base plate having a pair of fixed electrodes which are separated by a non-conductive area;

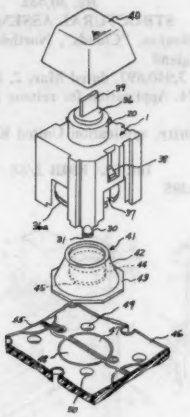
a key unit dismountably retained on said base plate, said unit including a key stem with a push button on top thereof and a key stem holder in slidable engagement with said key stem;

a movable electrode mechanism, disposed between said key unit and said base plate, comprising, assembled into one body, (a) an inverted cup-like resilient cone having a restoring force against deformation by manual depressing of said push button, said cone being provided with an outwardly directed flange extending around the opening thereof, (b) a resilient member, made of an insulating material, fixed to an upper end of said resilient cone and positioned below said upper end, and (c) a movable electrode layer fixed to a lower end of said resilient member; and

an electrically insulating layer disposed between said pair of fixed electrodes and said movable electrode layer so as to form a capacitor switch in combination with said fixed and movable electrodes,

wherein said movable electrode layer is movable downwardly to switch ON when said push button is manually depressed and upwardly to switch OFF by the restoring force of said resilient cone, and

wherein said outwardly directed flange of said cup-like resilient cone is held stably in position between abutting portions of said key stem holder and an upper surface of said plate,



thereby causing said cone to envelop said capacitor switch, with the opening thereof contacting the surface of said base plate, and causing said movable electrode mechanism to be retained stably on said base plate while remaining easily removable by means of dismounting said key stem holder from said base plate.

PATENTS

GRANTED NOV. 11, 1980

ERRATA

For CLASS	See PATENT NO.
051–134.5 F	4,232,414
368–028	4,232,510
368–073	4,232,511
368–082	4,232,512
493–223	4,232,589
493–010	4,232,590
493–314	4,232,591
493–010	4,232,592
493–224	4,232,593
440–061	4,232,627
244–188	4,232,839
405–263	4,233,015
430–535	4,233,074
208–048 Q	4,233,137
208–106	4,233,138
208–112	4,233,139
208–180	4,233,140
208–236	4,233,141
203–010	4,233,152
564–057	4,233,239
564–004	4,233,240
564–221	4,233,241
564–249	4,233,242
528–089	4,233,243
564–423	4,233,244
564–506	4,233,245
568–402	4,233,246
568–464	4,233,247
568–487	4,233,248
568–926	4,233,249
568–926	4,233,250
570–220	4,233,251
570–231	4,233,252
528–226	4,233,450
250–214 AL	4,233,545

PATENTS

GRANTED NOV. 17, 1998

ERRATA

PATENTS

GRANTED NOVEMBER 11, 1980

GENERAL AND MECHANICAL

4,232,402

MULTI-FUNCTIONAL CONVERTIBLE GARMENT

Elizabeth M. Roche, Post and Rail Farms Rd., Palos Park, Ill. 60464

Filed Oct. 3, 1978, Ser. No. 948,161
Int. Cl.[2] A41D *1/00*
U.S. Cl. 2—93 **8 Claims**

1. A multi-functional convertible human garment comprising

(A) a sleeve equipped jacket for overlying upper portions of a torso having

(1) generally vertically extending, front opening, mating flaps, and

(2) one side of a first zipper-type slide fastener member means depending about bottom circumferential portions of said jacket including means mounting said first fastener member to said jacket,

(B) a first extension for overlying lower portions of such torso having

(1) generally vertically extending, front opening, mating flaps,

(2) upper circumferential portions thereof which are locatable in circumferentially adjacent relationship to said jacket bottom circumferential portions, said upper circumferential portions thereof being about equal to said jacket bottom circumferential portions, said first extension flaps being generally aligned with said jacket flaps,

(3) bottom circumferential portions thereof in transversely spaced, generally parallel relationship to said upper circumferential portions thereof, and

(4) one side of each of a second and a third zipper-type slide fastener member means depending about a different one of each of said upper circumferential portions thereof and said bottom circumferential portions thereof respectively, including respective means mounting said second and said third fastener members to said first extension,

(C) a second extension for overlying upper leg portions depending from such torso or, alternatively, for overlying upper shoulder portions of such torso, said second extension having

(1) generally vertically extending, front opening, mating flaps,

(2) upper circumferential portions thereof which are locatable in circumferentially adjacent relationship to said first extension bottom circumferential portions, said upper circumferential portions thereof being about equal to said first extension bottom circumferential portions, said second extension flaps being generally aligned with said first extension flaps, and

(3) one side of a fourth zipper-type slide fastener member means depending about said upper circumferential portions thereof including means mounting said fourth fastener member to said second extension,

(D) a separate and independent belt means for tightening about waist regions of such torso, or alternatively, for extending over shoulder portions of such torso, said belt means having

(1) upper and lower circumferential portions, said lower circumferential portions being locatable in circumferentially adjacent relationship to said second extension upper circumferential portions, said belt means being about equal in length to the distance about said second extension upper circumferential portions and being generally coextensible therewith, and

(2) a single zipper means being one side of a fifth zipper-type slide fastener member means depending about said lower circumferential portions thereof, including means mounting said fifth fastener member to said belt means,

(E) said first fastener member being disengagably interconnectable with said second fastener member, including reversable connecting means therefor, for engaging said jacket to said first extension, if desired,

(F) said third fastener member being disengagably interconnectable with said fourth fastener member, including reversable connecting means therefor, for engaging said first extension to said second extension, if desired,

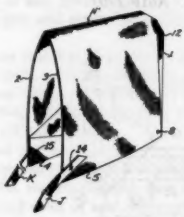
(G) said fifth fastener member being disengagably interconnectable with said fourth fastener member for engaging said belt means with said second extension, if desired.

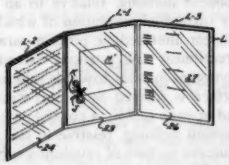
4,232,403

TRANSFORMABLE CHRISTENING BONNET AND BRIDE'S HANDKERCHIEF

Kathryn S. Burtis, 74116 De Anza Way, Palm Desert, Calif. 92660

Filed Apr. 2, 1979, Ser. No. 26,025
Int. Cl.[2] A42B *1/20, 15/04*
U.S. Cl. 2—204 **7 Claims**





1. In combination with a protective folder, a substantially square handkerchief of woven material and first and second ribbons of substantially equal length, said handkerchief capable of being carried as such by a bride at a wedding and subsequently said handkerchief and first and second ribbons when

removably combined cooperating to define a baby's christening bonnet, said handkerchief after use at said wedding and a christening being stored in said protective folder, said handkerchief formed from a foldable cloth and being substantially square and having first and second side edges and first and second end edges, said handkerchief prior to defining said christening cap having first, second and third fold lines formed therein, said first fold line intermediately disposed between said first and second edges and parallel thereto to divide said handkerchief into first and second rectangular panels, said second panel overlying said first panel, said second and third fold lines dividing said first and second panels into first and second generally triangular shaped segments that are separated by a generally trapezoidal intermediate segment, said first and second triangular segments each having first and second segments overlying a major portion of said intermediate segment, with portions of said first and second segments adjacent said intermediate segment overlapping one another; first means for removably securing said portions of said first and second segments together to define said bonnet, said bonnet having the top and sides thereof defined by said first panel and the rear thereof by said second panel, with the forward edge of said bonnet defined by said first end edge of said first panel, and the lower side edges and rear edge of said bonnet by said first and second side edges of said first panel; and second means for removably securing said first and second ribbons to the lower forward extremities of the sides of said bonnet, said first and second ribbons capable of being extended under the chin of a baby and tied to retain the bonnet in place on the baby's head, with the first and second means capable of being removed to permit the bonnet to be returned to the initial hankerchief configuration to again be used for the same purpose by subsequent generations.

4,232,404

ENDOPROSTHETIC ANKLE JOINT

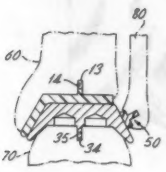
Kent M. Samuelson, Salt Lake City, Utah, and Michael A. Tuke, Morden, England, assignors to National Research Development Corporation, London, England

Filed Jul. 11, 1978, Ser. No. 923,687

Claims priority, application United Kingdom, Jul. 18, 1977, 30073/77

Int. Cl.³ A61F *1/03*

U.S. Cl. 3—1.91 **4 Claims**



1. An endoprosthetic ankle joint device, comprising:

a talar component defining, relative to an axis, a convex articulatory surface of revolution of which the generator has a rectilinear intermediate portion parallel to said axis and two rectilinear end portions extending in equally inclined divergent manner towards said axis, so that said convex surface is formed by a part-circular-cylindrical area flanked at each end by a coaxial part-conical area;

a tibial component defining, relative to said axis, an assymmetrical concave surface of revolution substantially complementary with and in articulatory engagement with said cylindrical area and only one of said conical areas; and

a fibular component having an articulatory surface engaged with the other of said conical areas;

said components being adapted remotely from said surfaces for respective securement to the talus, tibia, and fibula;

said talar component being, as a whole, symmetrical about the medial axial radial plane and the medial transverse radial plane of said cylindrical area; and

said tibial component being, as a whole, symmetrical about said axial plane.

4,232,405

PROSTHESIS JOINT

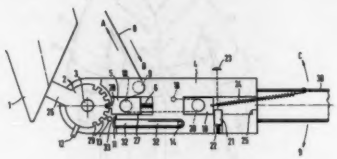
Franz Janovsky, Vienna, Austria, assignor to Viennatone Gesellschaft m.b.H., Vienna, Austria

Filed Nov. 13, 1978, Ser. No. 959,894

Claims priority, application Austria, Nov. 11, 1977, 8101/77

Int. Cl.³ A61F *1/04, 1/06*

U.S. Cl. 3—12.3 **4 Claims**



1. A prosthesis joint for the rotatable connection of two prosthesis parts pivotal in relation to each other, which comprises

(a) a detent body rotatably mounted on one of the prosthesis parts and fixedly connected to the other prosthesis part, the detent body having a periphery defining a series of detent notches and a lug affixed thereto and projecting from the periphery,

(b) a latch having a tip, the latch being mounted slidably in relation to the detent body,

(c) a spring biasing the latch against the detent body into a first position wherein the tip of the latch engages a respective one of the detent notches to lock the joint,

(d) a cable line attached to the latch and operable to move the latch against the spring bias into a second position wherein the tip of the latch is disengaged from the one detent notch to unlock the joint, operation of the cable line pivoting the one prosthesis part in relation to the other prosthesis part, and

(e) a stop part including a leaf spring having an angularly bent end displaceable between the notched periphery of the detent body and the latch by the lug to retain the latch in the second position.

4,232,406

WATER CLOSET VENTILATING SYSTEM WITH VACUUM BREAKER VALVE

Lester R. Beeghly, and George E. Gilchrist, both of 4400 N. Paulina Ave., Chicago, Ill. 60640

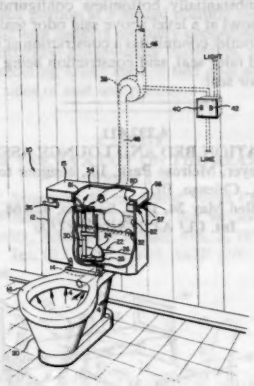
Filed May 18, 1979, Ser. No. 40,432

Int. Cl.³ E03D *9/04;* A47K *13/00*

U.S. Cl. 4—213 **8 Claims**

1. In a system for ventilating water closets of the type having a flush tank for storing water at a storage level, said flush tank having a cover adapted to fit thereon, a bowl having a flush ring with a plurality of apertures formed around the periphery of said bowl, conduit means connecting said flush tank with said bowl, a standpipe mounted within said flush tank and having its lower end communicating with said flush ring and its upper end communicating with the space above the normal level of the water in said flush tank, and means for effecting the withdrawal of gases from said space and consequently from said bowl, the improvement of which comprises the inclusion of means responsive to lowering of the water level in said flush

tank for venting the space above the level of the water in said tank to the atmosphere during flushing so as to eliminate any



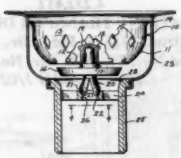
vacuum in said space and thereby prevent any restriction of the flow of water from said flush tank into said bowl.

4,232,407

BASKET STRAINER AND STOPPER ASSEMBLY FOR SINKS

Frank N. Williams, Sandwich, Ill., assignor to Bradley Corporation, Menomonee Falls, Wis.

Filed Mar. 19, 1979, Ser. No. 21,581
Int. Cl.³ A47K *1/14;* E03C *1/26*
U.S. Cl. 4—287 **3 Claims**



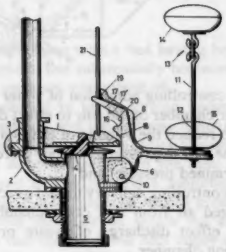
1. In a basket strainer-stopper assembly for closing the drain opening of a sink having a drain plate with a central opening extending across the drain opening, which basket strainer-stopper assembly comprises a cup-shaped basket strainer, a stopper for closing the drain opening positioned below the basket strainer and the means which hold the assembly in an open drain position and cooperate with the opening in the drain plate to retain the assembly in a closed drain position, the improved means which comprise a stem extending axially through the basket strainer and the stopper, said stem having an upper portion projecting into the basket strainer to provide a handle and a lower forked portion having a plurality of individual arcuate legs which are connected at one end to the stem and have tips at the other end that support the assembly in a stable position upon the drain plate about the central opening when the assembly is in an open drain position, said arcuate legs being sufficiently resilient so that when a downward force is exerted on the upper portion of the stem the legs will flex inwardly sufficiently to pass through the central opening in the drain plate so that the assembly can assume a closed drain position and so that the legs also will flex inwardly when the upper portion of the stem is pulled upwardly so that the assembly can be moved from the closed drain position to an open drain position.

4,232,408

TWO VARIABLE FLUSH GATE FOR LAVATORY RESERVOIR

Lee Chen-Yuan, No. 14 Alley 6 Lane 251 Fu-Te Street, Taipei, Taiwan

Filed Mar. 30, 1979, Ser. No. 25,547
Int. Cl.³ E03D *1/14, 1/34*
U.S. Cl. 4—325 **5 Claims**



1. A flush gate for a toilet flush tank having two modes of actuation for permitting two different water volumes to be selectively flushed, comprising, in combination:

a pivot area,

a first control piece pivoted at said pivot area to a flush gate housing having first and second extremities on opposed sides of said pivot area,

a flush gate seal pivotably mounted on said flush gate housing,

means on said first extremity to engage and retain said flush gate seal overlying said flush gate for one time interval

first float means on said second extremity to disengage said seal from said first extremity when the water volume falls to a selected level;

a second control piece pivoted at said pivot area and laterally spaced from said first control piece, and substantially parallel thereto having first and second extremities on opposed sides of said pivot area with means on said first extremity to engage and retain said seal for a second time interval, and second float means on said second extremity to disengage said seal when the water volume falls to another selected level, said first and second control pieces being pivoted in said pivot area about a single pivot axis.

4,232,409

PNEUMATIC ASSISTED FLUSHING APPARATUS FOR TOILETS

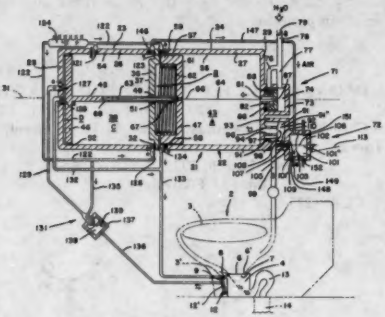
Minh Van Pham, 3200 Ridgewood Rd., Willits, Calif. 95490

Filed Aug. 21, 1978, Ser. No. 935,382
Int. Cl.³ E03D *3/10, 11/00, 5/012*
U.S. Cl. 4—362 **33 Claims**

1. An apparatus for compressing a predetermined volume of air without the use of an independent motor-driven air compressor and for delivering said compressed air under pressure to the evacuation chamber of a pneumatic assisted water flush toilet bowl to discharge waste products from the evacuation chamber, comprising:

(a) a fluid-tight housing having walls defining a hollow interior;

(b) at least one piston reciprocable within said housing and constituting a displaceable wall defining with said housing walls a pair of chambers variable in volume in response to displacement of said piston, one of said chambers of said pair containing air at a predetermined pressure;



(c) means controlling admission of water under pressure to the other chamber of the pair to effect displacement of the piston to reduce the volume of the first mentioned chamber of the pair to pressurize the air therewithin above said predetermined pressure; and

(d) means controlling delivery to said evacuation chamber of pressurized air from said other chamber of the pair to thereby effect discharge of waste products from said evacuation chamber.

4,232,410

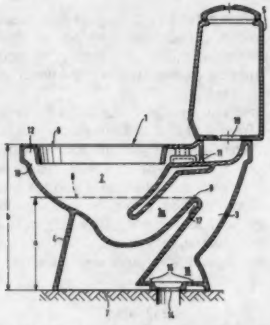
WATER CLOSET

Torbjörn Forsbäck, Ekenäs, and Arvo Förbom, Vantaa, both of Finland, assignors to Oy Wartsila Ab, Helsinki, Finland

Filed Dec. 15, 1978, Ser. No. 969,860

Int. Cl.[3] E03D *11/18*

U.S. Cl. 4—415 **15 Claims**



1. A water closet including a body portion with an upper level and a lower level, and integral with said body portion, a closet bowl and an outlet conduit forming an odor seal at the bottom of said bowl, said odor seal having an outlet crest determining the highest water level of said odor seal, further a flush water container adjacent to said body portion and means for flushing said closet bowl by means of water passing by gravity from said flush water container through said bowl and said outlet conduit, wherein the improvement consists in the combination of the following features:

(a) that said odor seal outlet crest is at a height level of at least 50 percent of the height of said upper level measured from said lower level;

(b) that close to said upper level there is an annular flush duct of substantially bottomless configuration opening into said bowl at a level above said odor seal outlet crest;

(c) that said outlet conduit has a constriction at its outlet end below said odor seal, said constriction being downstream of said odor seal

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4,232,411

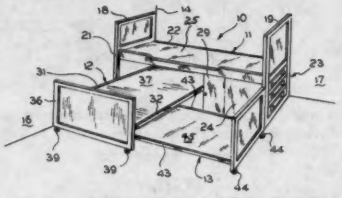
COMBINATION BED AND LOUNGE ASSEMBLY

Henning J. Speyer, Melrose Park, Ill., assignor to Sears, Roebuck and Co., Chicago, Ill.

Filed May 24, 1979, Ser. No. 42,168

Int. Cl.[3] A47B *83/00, 87/00*

U.S. Cl. 5—8 **4 Claims**



1. A combination bed and lounge assembly comprising first, second and third bed units, each having an occupant supporting member, the supporting member of the first bed unit being highermost, the supporting member of the second bed unit being below the supporting member of the first bed unit and the supporting member of the third bed unit being below the supporting member of the second bed unit, whereby in a lounge mode an end portion of said second bed unit is received in the space under the supporting member of said first bed unit and an end portion of said third bed unit is received in the space under the supporting member of said second bed unit which is remote from the first bed unit, with said second bed unit being disposed at a right angle to said first bed unit and the third bed unit being disposed at a right angle to said second bed unit and parallel to said first bed unit and forming a three tiered lounge assembly, said bed units being independently manually separable for sleeping purposes.

4,232,412

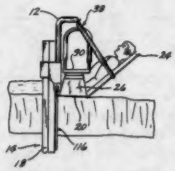
PATIENT TRANSFER DEVICE

Bartholomew Petrini, 7517 N. Ridge Dr., Omaha, Nebr. 68112

Filed Nov. 30, 1978, Ser. No. 964,831

Int. Cl.[2] A61G *1/02*

U.S. Cl. 5—86 **10 Claims**



1. A device for supporting a patient on a lift apparatus comprising,

a generally rigid back portion,

a generally rigid seat portion foldably connected to a lower end of said back portion,

a main support yoke including an upper cross bar, and a pair

of yoke arms extended downwardly from opposite ends of said cross bar,

means for supporting said cross bar on said lift apparatus,

means for pivotally connecting lower ends of said yoke arms to said back portion at a medial position thereon,

a pair of dual arm hangers pivotally connected to said cross bar and extended downwardly therefrom, and

means for securing lower ends of said dual arm hangers to opposite sides of said seat portion.

4,232,413

DEVICE FOR USE AS A COT ON THE REAR SEAT OF A VEHICLE

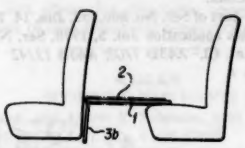
Jacques H. C. Mongault, 82 rue Dutot, 75015 Paris, France

Filed Sep. 29, 1978, Ser. No. 947,098

Claims priority, application France, Oct. 3, 1977, 77 29626

Int. Cl.³ A47C *27/08*; A47F *1/00*

U.S. Cl. 5—94 **22 Claims**



1. Apparatus for forming a cot adapted for use for the rear seat of a vehicle comprising

a having three sides only formed by a front element and a lateral element extending from each end of said front element,

a web of flexible cloth stretched between said three frame elements, the portion of the web extending from the unstructured rear of the frame adapted to rest directly on the vehicle rear seat, and

means connected to said frame adapted for supporting the frame from a fixed point of the body of the vehicle.

4,232,414

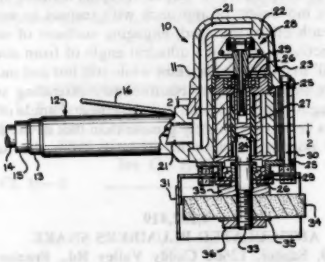
FREE-WHEELING OVERSPEED GRINDER DEVICE

George R. Curtiss, Chardon, Ohio, assignor to Cooper Industries, Inc., Houston, Tex.

Filed Jul. 10, 1978, Ser. No. 923,163

Int. Cl.³ B24B *23/00*

U.S. Cl. 51—134.5 F **5 Claims**



1. A vertical grinder comprising, in combination, a motor having a rotor and stator, a grinding wheel, a drive shaft operably connected to said grinding wheel and means for coupling said motor rotor to said drive shaft, said means including mechanically parallel slip clutch means for frictionally engaging said rotor and said shaft and overrunning clutch means for achieving power transfer from said motor rotor to said drive shaft and inhibiting power transfer from said shaft to said rotor said slip clutch means including at least one clutch annulus disposed between said shaft and said rotor.

4,232,415

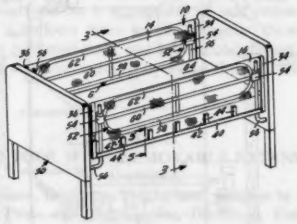
MATTRESS SLING

Gloria C. Webber, 44 Gail Dr., New Rochelle, N.Y. 10805

Filed Mar. 19, 1979, Ser. No. 21,913

Int. Cl.³ A47C *21/08*

U.S. Cl. 5—427 **8 Claims**



1. A mattress sling for use with a bed having head and foot ends, a mattress support, and substantially horizontal side rails which reciprocate on posts, comprised of:

a base portion adapted to be positioned under a mattress between the mattress and the mattress support, and

two spaced, opposed side portions each (i) having longitudinal proximate edges connected to the base portion, (ii) having head and foot edges and a longitudinal remote edge, (iii) being of a longitudinal length greater than the distance between the posts on which the side rails are mounted such that the head and foot edges are positionable between the posts and the head and foot ends of the bed, and being of a vertical length such that the longitudinal remote edge is positionable below the lowermost side rail, and (iv) having attached thereto releasable securing means in the form of a strip of adhesive material along each head and foot edge, and pieces of pairs of adhesive material positioned adjacent its longitudinal proximate edge and its longitudinal remote edge, for releasably securing each side portion to itself about the side rails so that when a mattress is on the base portion, each secured side portion extends substantially tautly and substantially vertically upward from adjacent the side of the mattress to and over a side rail most vertically removed from the mattress, and downward such that the pairs of pieces of adhesive material are releasably secured to each other vertically below the lowermost side rail, adjacent the side wall and bottom of the mattress, and the strips of adhesive material are secured to each other along the head and foot edges between the posts and the head and foot ends of the bed, to thereby prevent the mattress from shifting out of its proper position of the mattress support, and prevent the bed occupant or his or her appendage from becoming lodged between the lowermost side rail and the mattress or mattress support.

4,232,416

PROCESS FOR WETTING FIBER

Charles W. Burgin, Columbus, Ga., assignor to Morton Machine Works, Incorporated, Columbus, Ga.

Filed Apr. 13, 1979, Ser. No. 29,774

Int. Cl.³ D06B *5/12*

U.S. Cl. 8—156 **1 Claim**

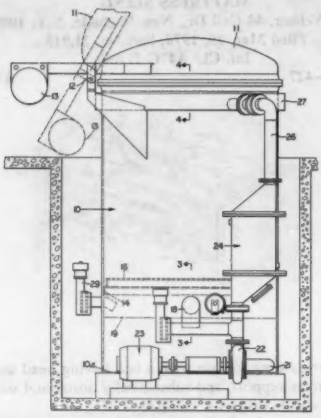
1. The process of wetting masses of fiber comprising:

(a) supporting a mass of fiber to be wetted on a generally horizontally disposed, air and liquid permeable member located intermediate the upper end and closed bottom of a vessel,

(b) supplying liquid to the upper surface of the fiber mass

whereby it flows downwardly, displacing entrapped air in the fiber mass and discharging it from the bottom of the fiber mass,

(c) collecting in the bottom of the vessel liquid which flows



through the mass and recirculating at least a portion of the same through the fiber mass, and

(d) venting from the vessel air displaced from the fiber mass at a point below the fiber mass and above the level of the liquid which collects in the bottom of the vessel.

4,232,417

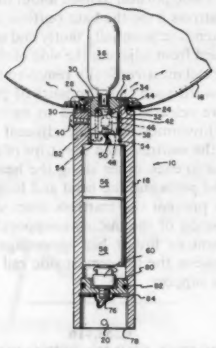
MARINE MAMMAL RETRIEVAL APPARATUS

Donald Miller, Del Mar, and Robert W. Skipton, San Diego, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 24, 1979, Ser. No. 6,055

Int. Cl.[3] B63B *21/52*; B63C *9/16*

U.S. Cl. 9—8 R **9 Claims**



1. A retrieval apparatus comprising:

a flotation bag;

gas pressure bottle means;

explosive means connected to the pressure bottle means for puncturing the bottle means;

electronically operated timing means connected to the puncturing means for activating the puncturing means so as to puncture the bottle means after a predetermined time;

a power source;

an on-off switch adapted to be connected to the power source for applying power to the timing means when the switch is turned on;

an elongated pressure housing which has a top opening at one end;

the puncturing means, timing means, power source, and on-off switch being mounted within the housing;

the flotation bag being sealably mounted to the pressure housing opening so that the interior of the bag is in communication with the interior of the housing;

the pressure bottle means extending from the top opening into the flotation bag; and

the switch being mounted through the housing and having a manual actuator located exteriorly thereof.

4,232,418

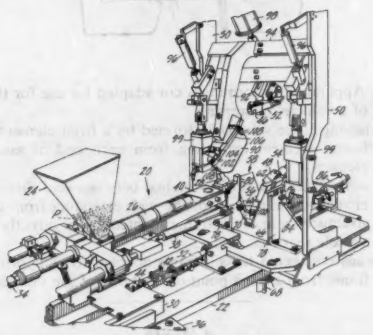
MACHINE FOR STIFFENING AND FORMING SHEET MATERIAL

John G. Hollick, Beverly, Mass., assignor to USM Corporation, Farmington, Conn.

Continuation-in-part of Ser. No. 806,559, Jun. 14, 1977, Pat. No. 4,127,910. This application Jul. 5, 1978, Ser. No. 921,944

Int. Cl.[2] A43D *7/00*; A43B *13/42*

U.S. Cl. 12—61 A **26 Claims**



13. In a machine for preforming and stiffening the backpart of a shoe upper preparatory to a lasting operation thereon, movable gripper means for transferring the upper from a position wherein it is suspended and disposed to receive a deposit or series of deposits of thick, hot, molten resin on the inside at the back portion of the upper to a backpart shaping position, and a pair of cooperative V-shaped backpart formers mounted for relative movement of approach with respect to said position and each other, the work engaging surfaces of said formers respectively defining a dihedral angle of from about 30° to about 60° to distribute the resin while still hot and molten as a generally thinner, coating continuously extending substantially throughout the backpart, and the dihedral angle of one of the formers being only slightly greater than that of the other to cause said coating to taper in thickness from the backpart extremity.

4,232,419

ARTICULATED PLUMBERS SNAKE

Winston D. Sanger, 12600 Cuddy Valley Rd., Frazier Park, Calif. 93225

Filed Mar. 26, 1979, Ser. No. 23,587

Int. Cl.[3] B08B *9/02*

U.S. Cl. 15—104.3 SN **2 Claims**

1. A powered plumbers snake comprising:

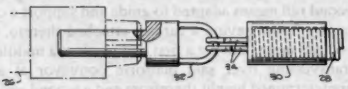
an elongated flexible water pipe cleaning element having a driven end section,

a power hand tool having a rotary chuck and having a given direction of work rotation,

the driven end section of said flexible water pipe cleaning element having an end portion comprising a shank removably clamped in said chuck,

said flexible element, excepting said driven end section, comprising a plurality of additional sections having complementary detachable connections,

said additional sections each having at one end, a closed loop,



the other end of each such section having split spring ring means within which said closed loop is removably received,

and said driven end section having its end opposite from the shank end, means for detachable connection selectively with one of said detachable connections.

4,232,420

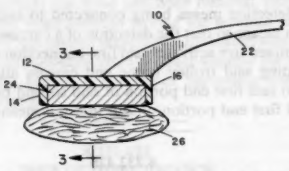
SCOURING PAD HANDLE

Sam Schuster, and Lilian E. Schuster, both of 2625 Pirineos Way, Apt. #124, La Costa, Calif. 92008

Filed Apr. 23, 1979, Ser. No. 32,529

Int. Cl.³ A47K *7/02*; A47L *13/46*

U.S. Cl. 15—209 D **5 Claims**



1. A detachable handle for scouring pads of the type constructed at least in part of magnetically attracting material the improvement in said handle comprising:

a generally box like body portion having a downwardly opening cavity adapted to receive and mount a magnet;

a water immersible permanent magnet mounted in said cavity of said body portion; and

a handle member adapted to be grasped by the hand of an individual secured to said body portion and extending upward and outward therefrom.

4,232,421

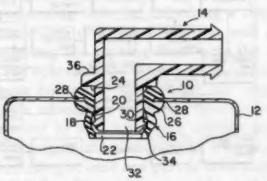
ALTERNATIVE DIAMETER GASKET

James I. Tucker, Manhattan Beach, Calif., assignor to Orion Industries, Inc., Compton, Calif.

Filed Mar. 16, 1979, Ser. No. 21,212

Int. Cl.² B65D *7/48*

U.S. Cl. 16—2 **5 Claims**



1. A dual diameter gasket formed as a flexible cylindrical annular sleeve having inner and outer surfaces with a uniform wall thickness therebetween and opposing ends, and said inner surface is of a uniform first diameter throughout its length, between said opposing ends, and an annular lip protrudes radially inwardly from said inner surface at one of said ends and an externally directed collar is integrally formed with said sleeve at the opposite end thereof and an annular recess configured to receive said lip is formed in said interior surface of said sleeve at said opposite end, whereby said sleeve is axially collapsible upon itself throughout its entire length into a toroidal shape and said lip is engageable in said recess and said sleeve has a uniform inner second diameter throughout its length in its collapsed state, and said second diameter is equal to said first diameter reduced by twice the wall thickness of said sleeve.

4,232,422

HAND TOOL WITH REMOVABLE EXTENSION HANDLE

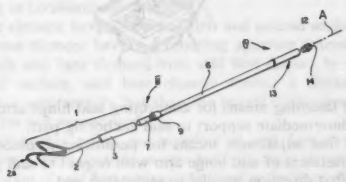
Ruedi Fellmann, Dietlikon, Switzerland, assignor to Max Langenstein Feld- und Gartengeräte, Illertissen, Fed. Rep. of Germany

Filed Sep. 21, 1978, Ser. No. 944,311

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1977, 7729610[U]

Int. Cl.³ A01B *1/14*; F16D *1/00*

U.S. Cl. 16—110 R **9 Claims**



1. A tool comprising:

an implement;

a relatively short elongated handle having a front end connected to said implement and a rear end formed with a longitudinally backwardly open recess and having a longitudinally backwardly directed rim surrounding this recess;

a relatively long extension handle having a front end formed as a longitudinal projection snugly engageable forwardly in said recess and longitudinally slidable and rotatable therein;

a connecting ring surrounding and fixed longitudinally and rotationally to said extension handle adjacent said front end thereof, said ring having a forwardly directed end face engageable longitudinally flatly against said rim and having a forwardly extending collar extending from said end face toward said front end of said extension handle and engageable inside said recess with said rear end of said short handle; and

means including interengaging generally helical formations on said collar and in said recess of said short handle for locking said handles together screwthread-fashion with said end face bearing longitudinally on said rim.

4,232,423

FURNITURE HINGE

Manfred Schnelle, D-4901 Hiddenhausen 2, Am Reesberg 22, Fed. Rep. of Germany

Filed Aug. 7, 1978, Ser. No. 931,553

Claims priority, application Fed. Rep. of Germany, Aug. 9, 1977, 2735825

Int. Cl.² E05D *7/04*

U.S. Cl. 16—130 **15 Claims**

1. A hinge member for attachment into at least one bore in a

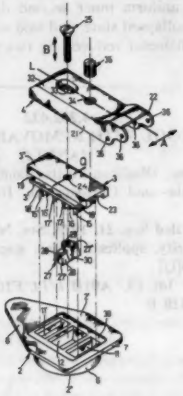
panel, said hinge member having at least one axis pivot comprising:

(a) an anchoring part for insertion into said at least one bore and having means for holding said anchoring part in said at least one bore;

(b) an intermediate support;

(c) at least one flexible ratchet member on one of said intermediate support and said anchoring part and engageable with the other thereof for cooperatively connecting said anchoring part and said intermediate support together;

(d) a hinge arm;



(e) fastening means for connecting said hinge arm and said intermediate support to said anchoring part;

(f) first adjustment means for permitting displacement adjustment of said hinge arm with respect to said panel in a first direction parallel to said panel; and

(g) said fastening means including walls in said anchoring part defining at least one opening therein, said fastening means further including at least two opposed flexible wall sections on said intermediate support fitting into said at least one opening, and clamping means for expanding said opposed flexible wall sections against said walls.

4,232,424

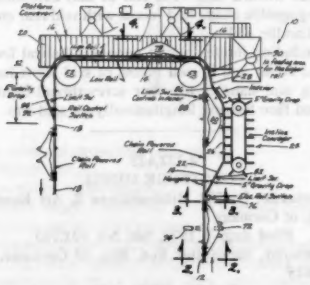
TWO RAIL OVERHEAD CONVEYOR DEVICE

John C. Denefe, 10832 Stone Canyond Rd., Apt. 2402, Dallas, Tex. 75230

Division of Ser. No. 869,006, Jan. 12, 1978. This application Apr. 16, 1979, Ser. No. 30,222

Int. Cl.[3] A22B *5/00*

U.S. Cl. 17—24 **11 Claims**



1. In combination,

a revolving eviscerating platform conveyor apparatus adapted to support a workman, said platform adapted to revolve at a constant speed,

and a two rail overhead conveyor device for meat processing comprising,

a first rail means adapted to guide and support a conveyor trolley frame having a carcass attached thereto, said first rail means having a first end portion, a middle portion transversing over said platform conveyor at a first predetermined height therefrom and a second end portion,

a second rail means adapted to guide and support a conveyor trolley frame having a carcass attached thereto, said second rail means having a first end portion, a middle portion transversing over said platform conveyor at a second predetermined height therefrom and a second end portion,

first connection means for selectively detachably connecting said first end portion of said second rail means to said first rail means at a point before said middle portion,

first means for propelling a conveyor trolley frame having a carcass attached thereto at said constant speed along said middle portion of said first rail means and along said middle portion of said second rail means,

second means for propelling a conveyor trolley frame having a carcass attached thereto along said first end portion and said second end portion of said first rail means,

third means for propelling a conveyor trolley frame having a carcass attached thereto along said first end portion and said second end portion of said second rail means, and

a detection means operationally attached to said first end portion of said first rail means to detect a carcass of a predetermined size, attached to a conveyor trolley frame on said first end portion,

said detection means being connected to said first connection means so that the detection of a carcass of said predetermined size activates said first connection means thereby guiding said trolley frame and carcass attached thereto onto said first end portion of said second rail means from said first end portion of said first rail means.

4,232,425

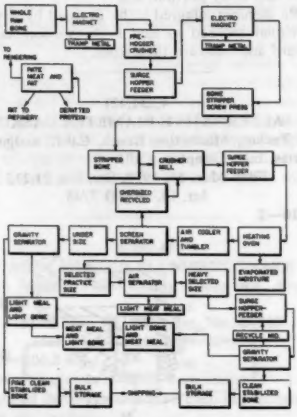
METHOD OF PRODUCING STABILIZED BONE

Herbert W. Wojcik, Palos Heights, Ill., assignor to Darling & Company, Chicago, Ill.

Continuation-in-part of Ser. No. 966,078, Dec. 4, 1978, abandoned. This application Jan. 15, 1980, Ser. No. 112,204

Int. Cl.[3] A22C *25/16*

U.S. Cl. 17—46 **14 Claims**



1. Process for cleaning and stabilizing raw bone consisting essentially of:

(a) reducing raw bone from its natural state to a size suitable for passing the raw bone into a press with a screw-type conveyor and feeding said raw bone having soft non-bone material including moisture, fat and meat tissue associated therewith into said press with said screw-type conveyor mounted within a cage having at least one wall provided with apertures smaller than the minimum size desired in the bone product,

(b) applying pressure by means of said screw-type conveyor to said raw bone within said cage to force fat and meat tissue through said apertures in the cage and discharging from said cage separately from said fat and meat tissue pressed raw bone material having a particle size ranging between about ¼ inch and about 1¼ inches stripped of a substantial portion of said fat and meat tissue associated with said raw bone,

(c) feeding pressed raw bone material having a particle size between about ¼ inch and about 1¼ inches and having moisture and residual fat and meat tissue associated therewith into an oven dryer and heating said pressed raw bone material therein without scorching said raw bone material to reduce the moisture content of said bone material and effect crisping said residual fat and meat tissue remaining on said pressed raw bone material whereby said crisped fat and meat tissue are adapted to be separated from the pressed bone material by fracturing the crisped fat and meat tissue during screening and gravity separation treatment of said bone material,

(d) passing said bone material from said dryer through a screen separator means which removes all but a selected range of particle size from said bone material, and

(e) feeding said bone material having the selected range of particle size to a gravity separator means from which high density clean stabilized bone product suitable for making high quality gelatin is recovered separately from low density material.

4,232,426

WEB GUIDING DEVICE

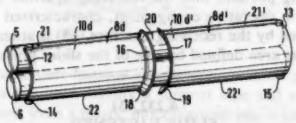
Wolfgang Beneke; Paul G. Teichmann, and Wilfried Weber, all of Mönchen-Gladbach, Fed. Rep. of Germany, assignors to Trützschler GmbH & Co. KG, Mönchen-Gladbach, Fed. Rep. of Germany

Filed Mar. 16, 1978, Ser. No. 887,215

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1977, 2711619

Int. Cl.[2] **D01G** *15/46*

U.S. Cl. 19—106 R **21 Claims**



1. In a carding machine including a cylinder; a web delivering assembly arranged downstream of the cylinder and including a pair of cooperating rolls for delivering a running fiber web; a device arranged downstream of the web delivering assembly for gathering the running fiber web; the device including at least one operationally substantially stationary guide element having a hollow guiding face, the improvement wherein said guide element is supported downstream of and immediately adjacent to said rolls; said hollow guiding face extending transversely to the direction of web discharge by said rolls and shrouding at least one part of both said rolls; and said hollow guiding face having upper and lower longitudinal bounding edges extending immediately adjacent and parallel to the one and the other of said rolls, whereby air is substantially prevented from impinging on the running web from the outside.

4,232,427

UNITARY BUTTON FASTENER

Gladys F. Mawhinney, 6202 S. Euclid, Tucson, Ariz. 85734, and George H. McFerron, 2700 N. Sunrock La., Tucson, Ariz. 85705

Filed Apr. 13, 1979, Ser. No. 29,639

Int. Cl.[3] **A44B** *1/18, 1/26*

U.S. Cl. 24—90 R **6 Claims**

1. A button attaching system for attaching a button having a hole or eyelet therein to a fabric, said button attaching system comprising in combination:

a. a base element having opposed first and second surfaces, said base element having a retaining aperture extending through said base element from said first surface to said second surface, said base element having a thickness which is substantially less than the lateral dimensions of said first and second surfaces;

b. a shaft having a first end attached to said first surface extending approximately perpendicularly from an attachment point of said first surface, said shaft including a sharp second end for penetrating the fabric, said attachment point being spaced from said retaining aperture, said flexible shaft being sufficiently flexible to permit said shaft to be bent to pass said second end through said hole, the portion of said shaft remaining on the first surface side of said base element forming a U-shaped path; and

c. retaining means attached to said shaft between said first and second ends for allowing said shaft to be easily passed through said retaining hole in the direction from said first side to said second side and preventing said shaft from being moved through said retaining hole in the direction from said second surface to said first surface, the portion of said second end of said shaft being removable after said passing of said shaft through said retaining hole;

said retaining means including a tapered element extending outwardly from said shaft, said tapered element having a first surface slightly inclined outwardly from the surface of said shaft and a second surface steeply inclined outwardly from the surface of said shaft,

a plurality of flange means disposed around the periphery of said retaining aperture for flexing toward said second surface of said base element in response to pressing of said first slightly inclined surface against said flange means as said tapered element is forced through said retaining aperture by a first force applied in a first direction to said shaft, said flange means also resisting flexing toward said first surface of said base element in response to pressing of said second steeply inclined surface against said flange means as a second force is applied to said shaft in a direction opposite to said first direction, said second force being substantially greater than said first force, said base element and said shaft being composed of plastic material, said base element being sufficiently thick that it is substantially unflexible,

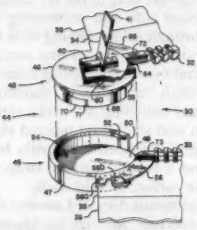
whereby said second end of said shaft can be passed through the fabric, one or more holes or eyelets of the button, back

through the fabric, and through said retaining aperture fasten the button to the fabric.

4,232,428
BELT BUCKLE
Lars Johansson, 631 Hicksville Rd., Far Rockaway, N.Y. 11691
Filed Feb. 2, 1978, Ser. No. 874,411
Int. Cl.³ A44B *11/20*
U.S. Cl. 24—188 **12 Claims**

1. A belt buckle formed of a front face piece and rear face piece parallel thereto when said buckle is closed, each of said face pieces being a single piece, said front face piece and rear face piece being the only face pieces present in said belt buckle, each face piece having opposed depending sides extending at substantially right angles thereto, and said rear face piece further having means for bracing said front face piece in the open position, there being at each of the sides of adjacent ends of each face piece opening holes with connectors therein which connectors are flush on the insides which face a belt and which connect the faces in a manner such at the two faces can open to a maximum angle of about 30° apart from each other, at which 30° angle the front face piece is braced by contact with said means on the rear face piece, each of said face pieces extending rearwardly substantially no further than the ends of their sides; and said front face piece includes an integral frictional wedged prong perpendicularly connected to the far end of said front face piece forwardly from said holes and said connectors, which prong can engage said rear face piece in a positive locking manner when the buckle is closed.

4,232,429
SLIDING FASTENER
Martin F. Friedberg, 7233 Aberdeen, Dallas, Tex. 75230
Continuation-in-part of Ser. No. 895,935, Apr. 13, 1978, abandoned. This application Sep. 7, 1978, Ser. No. 940,255
Int. Cl.³ A44B *19/36*
U.S. Cl. 24—205.11 R **11 Claims**



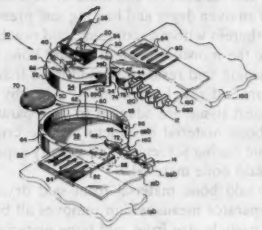
1. In a sliding fastener of the type used for joining sections of a garment and having first and second elongated interlocking elements each attached to one of said sections by a stringer, with said elememts being brought together into side by side interlocking relationship by a slider moving longitudinally along the elements, the improvement comprising:

an insert fastener including two complementary parts;

first means at one end of said first interlocking element for holding the slider in a position to be moved longitudinally to engage the first interlocking element, said first means including one of the insert fastener parts therewith; and

second means, at a corresponding end of said second interlocking element and including the other of the insert fastener parts therewith, for permitting said insert fastener to be closed by moving said parts together in a direction substantially non-parallel with said stringers, including while said elongated elements are positioned side by side, and for guiding the engagement of the slider with the second interlocking element when the insert fastener is closed.

4,232,430
DEVICE FOR CONNECTING THE ENDS OF A SEPARABLE ZIPPER
Martin F. Friedberg, 7233 Aberdeen, Dallas, Tex. 75230
Continuation-in-part of Ser. No. 940,255, Sep. 7, 1978, which is a continuation-in-part of Ser. No. 895,935, Apr. 13, 1978, abandoned. This application Mar. 15, 1979, Ser. No. 20,318
Int. Cl.³ A44B *19/36*
U.S. Cl. 24—205.11 R **51 Claims**

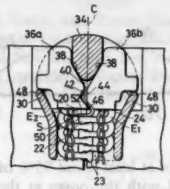


1. A device for connecting the ends of a separable zipper of the type having the first (**12**) and second (**14**) opposed rows of teeth and a slider (**24**) for engaging and disengaging the rows of teeth, each row of teeth being disposed along the edge of a supporting sheet (**16*a*, 16*b***), the slider having first (**39*a***) and second (**39*b***) adjacent ports at the front thereof which lead to a common passageway within the slider, the ports being adapted to receive the respective first and second rows of teeth as the slider is moved forward whereby the teeth in the opposed rows are progressively brought into interlocking engagement within the passageway, the device having first (**20**) and second (**22**) terminals disposed at the respective rearward ends of the first and second rows of teeth, the first terminal including means (**28**) for carrying the slider when the rows of teeth are fully disengaged, one of the terminals having portions (**60, 64**) defining an aperture (**65**) for receiving cooperating portions (**52,54**) of the other terminal such that insertion of the cooperating portions into the receiving aperture couples the terminals in operative engagement, characterized in that the area defined by the receiving aperture (**65**) is at least twice as large as the area defined by one of the slider ports (**39*b***).

4,232,431
SLIDE FASTENER
Shunji Akashi, Kurobe, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan
Filed Apr. 4, 1979, Ser. No. 27,097
Claims priority, application Japan, Apr. 20, 1978, 53/52455[U]
Int. Cl.² A44B *19/36*
U.S. Cl. 24—205.11 R **5 Claims**

1. An open end slide fastener comprising a pair of stringer tapes each carrying a row of coupling elements along one longitudinal edge, each of said coupling elements including a pair of spaced legs supported on one of said tapes and a coupling head extending between said legs, said coupling head having a pair of lateral projections extending longitudinally of the row of coupling elements beyond the width of the legs so that the rows of coupling elements can be interlocked together

by interengagement of said lateral projections of the opposed coupling heads, a slider having a diamond and adapted to open and close the fastener, and a top end stop including a pair of lugs secured to the longitudinal edges of the respective stringer tapes, said lugs having oblique opposed edges extending divergently with respect to the longitudinal axis of the fastener and



jointly defining therebetween a substantially V-shaped opening complementary in shape with the diamond of the slider, said interengaged lateral projections of the coupling heads of the opposed endmost coupling elements located next to said top end stop lugs being cut off to permit said endmost coupling elements to be desengaged from each other when the slide fastener is closed.

4,232,432

SEPARABLE SLIDE FASTENER

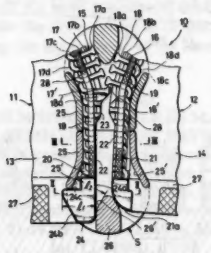
Shunji Akashi, Kurobe, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Filed Sep. 26, 1979, Ser. No. 78,931

Claims priority, application Japan, Oct. 9, 1978, 53-138698[U]; Oct. 9, 1978, 53-138699[U]

Int. Cl.³ A44B *19/40*

U.S. Cl. 24—205.11 R **5 Claims**



1. A separable slide fastener comprising a pair of oppositely disposed stringers each having a support tape and a fastener element formed from a plastic monofilament into a continuous structure secured by sewn seams to a longitudinal inner edge of the respective tape; the fastener element consisting of a succession of elongated loops each having a coupling head portion at one end thereof, an upper leg, a lower leg and a connecting heel portion at the opposite end remote from the coupling head connected to a next adjacent one of the successive loops; a reinforcing core extending through said succession of loops; and a slider having a pair of branched guide channels defined between its flanges and its diamond; a group of said successive loops being fused together over a predetermined length of the two coupled stringers at one end of the fastener and cut closely along the sewn seams to provide a pair of integrated pin members on the respective stringers, the group of fused loops on one stringer having a plurality of coupling head portions transferred from the other stringer.

4,232,433

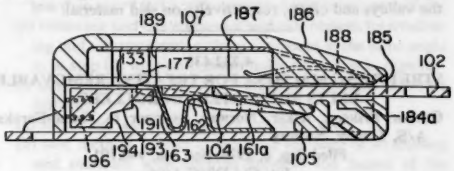
SEAT BELT BUCKLE DEVICE

Takeo Ueda; Shinichi Fujita; Hideo Tachiki, all of Fujisawa, and Shuichi Asano, Maebashi, all of Japan, assignors to NSK-Warner K. K., Tokyo, Japan

Division of Ser. No. 811,386, Jun. 29, 1977. This application Mar. 27, 1979, Ser. No. 24,377

Int. Cl.² A44G *11/26*

U.S. Cl. 24—230 A **10 Claims**



1. A latch device in a seat belt buckle, comprising: a load member, means supported on said load member for latching a tongue, means for biasing said latching means toward a tongue locking position, releasing means adapted, when operated, to bring the latching means into a tongue unlocking position, and false latching preventing means having selectively a first position where said latching means is held thereby in the tongue unlocking position and a second position where said latching means is freed therefrom, said preventing means being biased toward the first position and engages the tongue when the tongue is inserted, whereby when the tongue is inserted to displace the preventing means from the first position to the second position, the latching means latches the tongue, the preventing means is held in said second position by the latched tongue, and when the releasing means is operated to bring said latching means into the tongue unlocking position to free the tongue, the preventing means is brought from said second position to said first position.

4,232,434

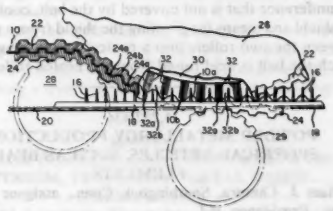
APPARATUS AND METHOD FOR ATTACHING STIFF CRIMPABLE MATERIAL TO A TENTER FRAME

Friedrich V. Pfister, Geneva, Switzerland, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 25, 1978, Ser. No. 909,554

Int. Cl.² D06C *3/02*

U.S. Cl. 26—86 **1 Claim**



1. In an overfeed system for supplying and attaching stiff crimpable material at its selvedges to the pin chains of a pin tentering machine that includes means for forwarding the material from a source to an overfeed means for squeezing the material at its selvedges into a wavy shape having crests and valleys and forwarding the material to the plane of the pin chains, comprising upper and lower endless toothed belts pressed together through which the material passes, the im-

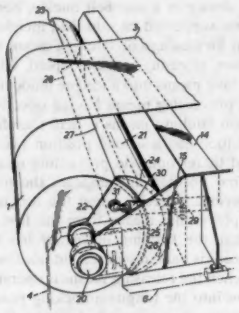
provement comprising a rotatable cylindrical brush formed of spaced groups of bristles located adjacent said overfeed means at each selvedge of the material and above said pin chain with said bristles projecting below the points of the pins, in which said brush has a peripheral surface with crests and valleys corresponding to crests and valleys imparted to the material by the overfeed means, said crests of said brush engage the valleys of said material, and said valleys of said brush are clear of the crests of said material, and means for rotating the brush synchronously with the movement of the wavy shaped selvedge edge of the material so that the crests and valleys on the peripheral surface of the brush are maintained in alignment with the valleys and crests, respectively, on said material.

4,232,435

STRETCHING MACHINE FOR TREATING REMOVABLE BELTS SUPPORTED ON ROLLERS

Gunnar Eriksen, Asker, Norway, assignor to Thune-Eureka A/S, Tranby, Norway

Filed Sep. 6, 1978, Ser. No. 940,101
Int. Cl.[2] D06C *3/06*
U.S. Cl. 26—106 **2 Claims**



1. In a stretching machine for treating removable belts supported on rollers, such as felts and wires in papermaking machines, the stretching machine comprising two rollers over which the belt is suspended, means to heat at least one of said rollers, and means to move one of the rollers toward the other to slacken the belt for removal from the rollers; the improvement comprising lifting means adapted to be inserted between the heated roller and the belt, such that the belt can be held raised up from the roller, the lifting means being pivotable about the axis of rotation of the heated roller and being formed as a shield running along the length of the roller and, seen in cross section, spanning at least a main portion of the roller circumference that is not covered by the belt, cooling ducts in the shield and means for pivoting the shield from a rest position between the two rollers into a protective working position in which the belt is held raised from the heated roller.

4,232,436

POWDER METALLURGY PRODUCTION OF SPHERICAL ARTICLES, SUCH AS BEARING ELEMENTS

William J. Chmura, Southington, Conn., assignor to Textron Inc., Providence, R.I.

Division of Ser. No. 774,024, Mar. 3, 1977, Pat. No. 4,118,009, which is a division of Ser. No. 503,279, Sep. 5, 1974, Pat. No. 4,026,657. This application Mar. 31, 1978, Ser. No. 892,027
Int. Cl.[3] B21H *1/14*
U.S. Cl. 29—148.4 B **4 Claims**

1. A method for producing a powder metallurgy article of manufacture characterized by a convex surface of revolution which comprises,

forming a sintered porous powder metal blank having said surface of revolution formed about a fixed axis passing through said blank having an average density ranging from about 70% to 90% of the theoretical density of the metal, and then mechanically working by roll forming substantially said entire convex surface of revolution of said article sufficient to produce a highly dense mechanically worked zone at and adjacent said convex surface of

average density of at least about 95% of theoretical density of the metal with the pores at the surface thereof substantially closed,

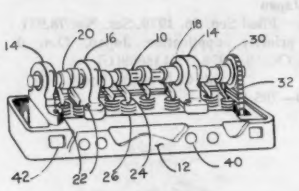
while maintaining the remaining portion of the sintered metal inwardly of the dense zone and extending towards said axis substantially porous and having an average density ranging from about 70% to less than 95% of the theoretical density of the metal.

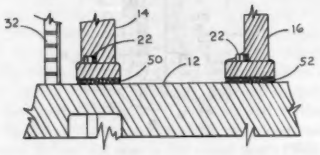
4,232,437

METHOD FOR RECONDITIONING AN ENGINE HEAD

James V. Fair, Tucson, Ariz., assignor to V & W Parts & Machine Shops, Inc., Tucson, Ariz.

Filed Jun. 30, 1978, Ser. No. 920,964
Int. Cl.[3] B23P *15/00, 13/00;* F01L *1/04*
U.S. Cl. 29—156.4 R **2 Claims**





1. A method of reconditioning engines where the engine head has become warped and distorted, the engine of the type having an overhead cam shaft supported by a plurality of cam towers atop the engine head, the cam shaft having a cam shaft sprocket at one end attached to a crank shaft sprocket in the body of the engine block by a timing chain having a fixed length, a chain tensioner interposed the cam shaft sprocket and the crank shaft sprocket to engage the chain and take up slackness therein within a certain limit, and the distance between the cam shaft sprocket and the crank shaft sprocket being a predetermined fixed length, the method comprising machining the engine head upper and lower surface to coplanar parallel surfaces to remove distortion in the head, selecting a thickness of shim to correspond to the thickness of the metal removed from the engine head upper and lower surfaces, and installing the shim between each of the cam towers and the head whereby the same predetermined fixed distance is maintained between

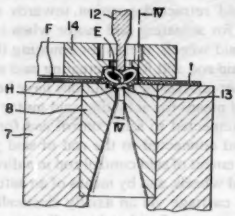
the cam shaft sprocket and the crank shaft sprocket as existed before the head had been planed and the head warped.

4,232,438

METHOD AND APPARATUS FOR PROVIDING SPACE SECTIONS IN A CONTINUOUS SLIDE FASTENER CHAIN

Kihei Takahashi, Uozu, and Toyoo Morita, Kurobe, both of Japan, assignors to Yoshida Kogyo K.K., Japan

Filed Nov. 29, 1978, Ser. No. 964,461
Claims priority, application Japan, Dec. 7, 1977, 52-146903
Int. Cl.³ B23P *19/00*
U.S. Cl. 29—408 **4 Claims**



1. A method for providing a space section in a slide fastener chain of the coiled plastic filament type in which the chain is stitched to a fastener tape with head portions at the edge of the tape and leg portions remote from the edge of the tape, which method comprises the steps of:

(a) supporting the slide fastener chain on the tape side thereof and adjacent the leg portions,

(b) lowering a punch having a cutter blade towards the head portions of the supported slide fastener chain, whereby the chain becomes inclined with the head portions exposed,

(c) cutting off the head portions of the chain by the cutter blade while the chain is kept in the inclined position, and

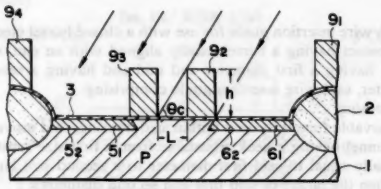
(d) removing the leg portions of the interlocking elements.

4,232,439

MASKING TECHNIQUE USABLE IN MANUFACTURING SEMICONDUCTOR DEVICES

Hiroshi Shibata, Kawasaki, Japan, assignor to VLSI Technology Research Association, Kawasaki, Japan

Filed Nov. 29, 1977, Ser. No. 855,639
Claims priority, application Japan, Nov. 30, 1976, 51-142918; Nov. 30, 1976, 51-142919; Dec. 31, 1976, 51-158060
Int. Cl.³ B01J *17/00*
U.S. Cl. 29—579 **4 Claims**



1. A method of manufacturing a planar type semiconductor device having a monocrystalline semiconductor substrate of one conductivity type and having at least one intermediate region different in properties from side regions on both sides thereof, comprising the steps of:

(a) forming a base, said base forming step including at least the forming of an oxide layer on one surface of said substrate;

(b) forming a resist layer on said base, said resist layer having a thickness t;

(c) selectively removing said resist layer to form a desired pattern including at least a pair of pattern portions spaced apart by a distance L substantially corresponding to the width of said intermediate region to form a window;

(d) introducing impurities of the other conductivity into said side regions of said substrate by irradiating said substrate with impurity ion beams obliquely at an angle equal to or less than $\tan^{-1}(t/L)$ with respect to said substrate surface;

(e) removing said oxide layer on said side regions by irradiating said substrate with etching ion beams at the same angle as in step (d) to form contact holes on said side regions;

(f) depositing ohmic electrode material over said substrate surface;

(g) removing said resist pattern portions; and

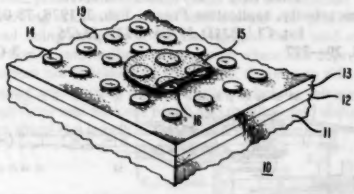
(h) said method further comprising the step of irradiating said substrate with vertical impurity ion beams of the other conductivity type.

4,232,440

CONTACT STRUCTURE FOR LIGHT EMITTING DEVICE

John J. Bastek, Reading, Pa., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 27, 1979, Ser. No. 15,717
Int. Cl.³ B01J *17/00*
U.S. Cl. 29—590 **7 Claims**



1. The method of making a substantially ohmic low resistance contact to the light emitting surface **19** of a light emitting semiconductor device **10** comprising the steps of;

(1) forming on said light emitting surface an array of small metallic contacts **14**,

(2) heating said device to alloy a portion of each said contact to said light emitting surface,

(3) selectively depositing a large area metal bonding pad **15** on said light emitting surface and over a plurality of said small contacts,

(4) subjecting the light emitting contact surface to sputter etching for a period of time sufficient to entirely remove the small contacts not covered by the bonding pad, and

(5) attaching a wire lead to the surface of said bonding pad.

4,232,441

METHOD FOR PREPARING RARE EARTH OR YTTRIUM, TRANSITION METAL OXIDE THERMISTORS

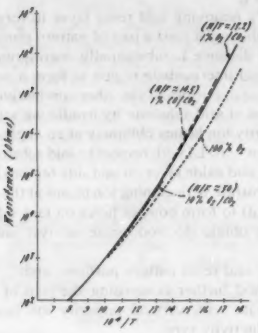
Eleftherios M. Logothetis, Birmingham; Kamlakar R. Laud, and John K. Park, both of Ann Arbor, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 857,498, Dec. 5, 1977, Pat. No. 4,162,631.
This application Jun. 29, 1978, Ser. No. 920,572
Int. Cl.³ H01C *7/00*
U.S. Cl. 29—612 **2 Claims**

1. A method for preparing a thermistor comprising a thermistor composition having iron, praesodynium and oxygen in a respective molar ratio of about 1:1:3, which comprises:

(a) admixing Pr_6O_{11} and Fe_2O_3 in a molar ratio of Fe to Pr of about 1:1;

(b) heating at a temperature above about 1000° C.; and



(c) incorporating at least two spaced apart conducting leads into the thermistor composition.

4,232,442

REMOVAL OF RESIDUAL STRESSES IN A TUBE SEATED IN A TUBE PLATE

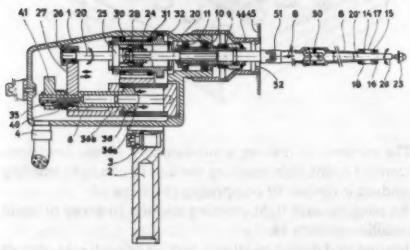
Daniel Brunaud, Saint-Germain-du Plain, France, assignor to Framatome, Courbevoie, France

Filed Feb. 1, 1979, Ser. No. 8,400

Claims priority, application France, Feb. 3, 1978, 78 03131

Int. Cl.[3] **B21D** *39/06;* **B23P** *15/26*

U.S. Cl. 29—727 **3 Claims**



1. Apparatus for removing residual stresses produced in a tube by an operation of seating the tube in a bore passing completely through a plate of high thickness, the tube being arranged relative to the plate with one of its ends flush with one of the faces of the plate and extending from the other face of the plate, the seating of the tube being carried out by expanding and rolling the tube at the level of the plate up to a transition zone in the region of emergence of the tube from the other face of the plate, said device comprising: a support adapted to permit handling thereof; an elongate tubular element defining a longitudinal axis; means mounting one end of said tubular element in said support for rotation about said longitudinal axis; a generally tubular cage provided in the other end portion of said tubular element and defining a plurality of longitudinally extending recesses therethrough; a wheel in each said recess which serves as a housing therefor; means mounting each said wheel in said respective recess such that said wheel is radially movable therein between an operative position projecting partially from said cage and a retracted position within said cage, said wheels having axes of rotation which make a small angle with said longitudinal axis; a rod for controlling said wheels, said rod extending coaxially within said tubular element and comprising at one end a terminal part of generally conical shape which penetrates into the interior bore of said cage and contacts said wheels; a motor for causing rotation; a jack for causing linear movement; means connecting said motor to said rod for rotating said rod about said longitudinal axis to cause rotation of said wheels by frictional contact with said wheels; means connecting said jack to said rod for moving said rod in the direction of said longitudinal axis relative to said tubular element to cause radial movement of said wheels; an adjustable stop for contacting the one face of said plate for precisely positioning said wheel cage in a tube at the level of the transition zone thereof; means mounting said stop on said support; control means for controlling rotational and linear movement of said rod relative to said tubular element to permit an exactly controlled expansion of the tube in the transition zone, and comprising means for actuating said jack to cause movement of said rod in a direction to move said wheels from said retracted position towards said operative position, means for actuating said motor when said rod comes to rest against said wheels, means for counting the revolutions performed by said rod and for deactuating said motor and said jack after a preset number of revolutions have been performed by said rod, said means for actuating said motor being defined by a carriage connected to said control rod for linear movement thereof and connected to the rod of said jack by direct contact for movement of said control rod in a direction causing retraction of said wheels, and by means of an actuating element bearing on said carriage via an axially elastically deformable member for movement of said rod in a direction causing radially outward movement of said wheels; and an electrical contact carried by said carriage for controlling actuation of said motor and operable by said actuating element which moves relative to said carriage when said rod comes to rest against said wheels.

4,232,443

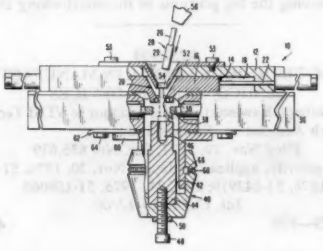
WIRE INSERTION GUIDE

Bernard Lichtenstein, and Edward Nemeth, both of Fair Lawn, N.J., assignors to VIP Industries, Inc., Paterson, N.J.

Filed Mar. 26, 1979, Ser. No. 23,669

Int. Cl.[3] **H01R** *43/04*

U.S. Cl. 29—753 **6 Claims**



1. A wire insertion guide for use with a closed barrel electrical contact having a barrel axially aligned with an end, said barrel having a first diameter and said end having a second diameter, said wire insertion guide comprising:

a housing;

a movable funnel located within said housing, said movable funnel having a neck adjustable from a first size substantially equal to said first diameter to a second size larger than the larger of said first and second diameters;

a fixed funnel nested within said movable funnel, said fixed funnel having a neck of diameter larger than the larger of said first and second diameters;

a contact holder mounted in spaced relation with said movable funnel, said contact holder including a sleeve in axial alignment with the necks of said fixed and said movable funnels, said sleeve being of a height greater than that of

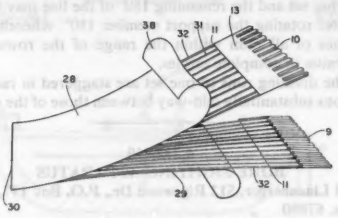
said end, and having a diameter slightly larger than that of said end.

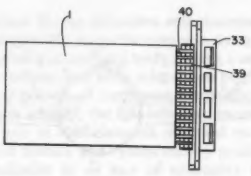
4,232,444

FLAT CABLE STRIPPING AND TERMINATING TECHNIQUE

Virgil T. Bolick, Jr., Asheville, N.C., assignor to Akzona Incorporated, Asheville, N.C.

Filed May 19, 1978, Ser. No. 907,447
Int. Cl.³ H01R *43/04*
U.S. Cl. 29—863 **11 Claims**





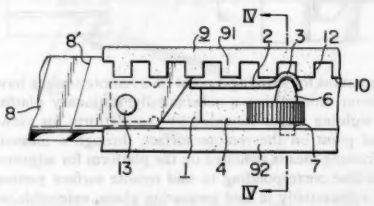
1. A method for preparing a flat cable having a plurality of substantially parallel wires for gang termination in a connector with opposite rows of contacts on its respective sides comprising: cutting through the jacket of the cable at an end thereof and forming portions of every other wire of the cable down and the remaining ones up, grasping the downturned wire ends and separately grasping the upturned ones, and pulling said wire ends in opposite directions separating one side of the cable jacket from the other side leaving two spaced parallel groups of wires ready for termination in a connector.

4,232,445

KNIFE APPARATUS

Daizaburo Ito, Seki, Japan, assignor to Kai Cutlery Center Co., Ltd., Seki, Japan

Filed Mar. 30, 1979, Ser. No. 25,749
Claims priority, application Japan, Mar. 31, 1978, 53-41890[U]
Int. Cl.³ B26B *1/08*
U.S. Cl. 30—162 **5 Claims**



1. A knife apparatus including a knife handle having a substantially C-shaped cross-section with a bottom wall and opposed side walls defining a groove or a channel extending longitudinally of said knife handle, said groove or channel having penthouse-like web portions extending toward each other from the top ends of said side walls and defining therebetween a gap through which said groove or channel is in communication with the outside of said knife handle, one of said web portions being provided with a series of notches formed in its inner edge confronting the other web portion; a cutting blade formed with a number of lines of breakage spaced in the longitudinal direction of said cutting blade; and a slider having opposite ends to one of which said cutting blade is detachably secured, said slider being received by said groove or channel for sliding movement along the length of said groove or channel;

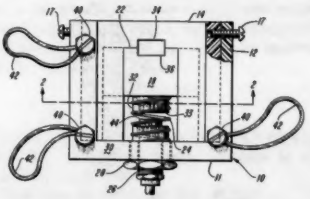
said slider being characterized by comprising a depressable resilient tab and a resilient clicking tab both secured to the slider and extending generally codirectionally from the end of said slider opposite to said one end thereof, said depressable resilient tab being provided with a pawl, said resilient clicking tab being adapted to be swung in the direction transverse to the direction of depression of said depressable resilient tab and having a curved end portion, said curved end portion of said resilient clicking tab being located opposite said pawl and being concave at one side to enable it to receive said pawl and convex at the other side so as to be engageable with a selected one of said notches formed in said one of said penthouse-like web portions, said depressable resilient tab when not depressed positioning said pawl at the level of said curved end portion of said resilient clicking tab and in engagement with said one side of said curved end portion so that the latter is interposed between said pawl and the selected notch receiving said other side of said curved end portion, said pawl being adapted to be disengaged from said curved portion of said resilient clicking tab when said depressable resilient tab is resiliently depressed, thereby to allow said curved end portion of said resilient clicking tab to disengage from said selected notch and to allow said slider to be slid along the length of said groove or channel.

4,232,446

GAGE FOR MEASURING DECREASE IN DIMENSION OF TEST SPECIMEN IN TENSILE TEST

Don F. Woods, North Ogden, and Ronald F. Larsen, Willard, both of Utah, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 30, 1979, Ser. No. 25,412
Int. Cl.³ G01B *3/20, 7/06*
U.S. Cl. 33—143 L **1 Claim**



1. A device for measuring the decrease in one dimension of a compression sensitive test specimen in a direction perpendicular to the applied stress in a tensile test machine, comprising:

a polytetrafluoroethylene frame member;

a polytetrafluoroethylene slidable member positioned in said frame member;

a means for providing a low friction bearing between said slidable member and said frame member;

notches in said slidable and frame members, for receiving a test specimen therebetween;

a spring positioned between the frame member and the

slidable member, on the side of said slidable member remote from said notches; and

a proximity measuring device secured to said frame member and a metallic target secured to the slidable member.

4,232,447

METHOD AND AN APPARATUS FOR CONTINUOUSLY MONITORING THE CROSS-SECTION OF SLIVERS

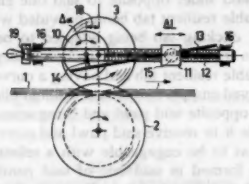
Werner Grunder, Monchaltorf, and Erwin Murbach, Werrikon-Uster, both of Switzerland, assignors to Zellweger Uster Limited, Switzerland

Filed Jan. 19, 1979, Ser. No. 4,879

Claims priority, application Switzerland, Feb. 2, 1978, 1130/78

Int. Cl.³ G01B 7/04

U.S. Cl. 33—147 L **11 Claims**



1. An apparatus for continuously monitoring and controlling the deviations in the cross-section of slivers, comprising a grooved roller, a feeler roller which cooperates with the grooved roller, and which is displaceable against a resistance force under the influence of a sliver located between the grooved roller and the feeler roller, a lever shaft on one end of which the feeler roller is eccentrically mounted, an eccentric measuring tab connected to the lever shaft and arranged to reproduce on a larger scale the rotational movements of the shaft, and sensor means including a sensor which lies in a plane determined by the axis of lever shaft and the axis of the feeler roller when no sliver is present for detecting the position of the measuring tab with respect to said plane without contact with said measuring tab.

4,232,448

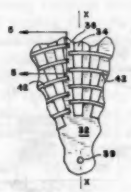
BROKEN LINE DRAFTING TEMPLATES

Carlos W. Veach, 8921 Ashcroft Ave., Los Angeles, Calif. 90048

Filed Apr. 9, 1979, Ser. No. 28,077

Int. Cl.³ B43L 13/20

U.S. Cl. 33—174 B **1 Claim**



1. Apparatus for drawing a broken line consisting of dashes with spaces therebetween, with a compass carrying a marking end, such as a pencil or pen, on a surface, such as a sheet of paper, comprising:

(a) a support member adapted to be fixedly disposed on said surface,

(b) concentric circular rows of relatively thin lands projecting from the support member forming spaces therebetween for exposing the surface therebelow,

(c) each land having an entry edge at one side thereof over which the end of the implement may freely move into contact with the exposed surface disposed in a space between lands and an exit edge at its other side for camming said end out of said space onto the adjacent land, and

(d) the construction being such that as the implement is moved along its guided path, its marking end oscillates toward and from the surface, producing the spaced marks thereon only in the spaces between lands,

(e) the circular rows being formed as two angularly spaced sets, each set extending substantially 180° about a center and having dividing rims between rows which preclude drawing beneath same, the rims being staggered so that a line which cannot be drawn in one set may be drawn in the other set and the remaining 180° of the line may be drawn after rotating the support member 180°, whereby broken lines of all radii within the range of the rows may be drawn in complete circles,

(f) the dividing rims of one set are staggered in radial positions substantially mid-way between those of the other set.

4,232,449

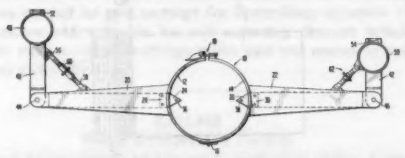
BORE SIGHTING APPARATUS

Darrell Linenberger, 512 Rigewood Dr., P.O. Box 177, Ulysses, Kans. 67880

Filed Oct. 15, 1979, Ser. No. 84,710

Int. Cl.³ F41G 3/32

U.S. Cl. 33—235 **5 Claims**



1. A bore sighting apparatus comprising clamping ring means adapted to be clamped adjacent the muzzle end of a tube, a pair of horizontally disposed arms secured to said ring means and extending outwardly therefrom in opposite directions, a pair of witness sight means hingedly secured to said arms adjacent said ring for alignment with witness marks on said tube, a pair of vertically disposed arms pivotally secured to the ends of said horizontally disposed arms respectively and target means mounted on each of said vertically disposed arms for use with the sights adjacent the breach end of said tube.

4,232,450

FOOTBALL YARDLINE LOCATING DEVICE

William E. Lynn, 209-A Millbrook Rd., Raleigh, N.C. 27609

Filed Nov. 14, 1978, Ser. No. 960,554

Int. Cl.³ G01B 11/26

U.S. Cl. 33—289 **9 Claims**

1. Apparatus for locating a point on a remote surface having a perimeter, comprising a substantially stationary platform, optical sighting means mounted by the platform for viewing said said point on the remote surface through a measuring plane, framing means mounted on the platform for adjustment to an outline corresponding to said remote surface perimeter viewed substantially in said measuring plane, extensible scale means movably mounted by the framing means for displacement substantially in said measuring plane, and actuating means connected to the scale means for displacement thereof

to a measuring position indicating the location of said point on the remote surface relative to said perimeter as outlined in the measuring plane.

4,232,451

DETECTOR FOR SENSING THE ANGULAR POSITION OF A ROTATABLE MAGNET

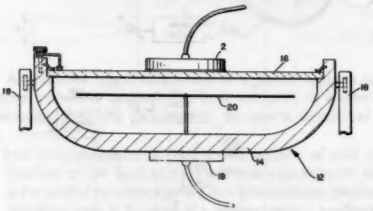
Ib Thomsen, Livadiavej 50, DK-6960 Hvide Sande, Denmark

Continuation of Ser. No. 764,017, Jan. 31, 1977, abandoned. This application Sep. 28, 1978, Ser. No. 946,621

Claims priority, application Denmark, Feb. 19, 1976, 679/76

Int. Cl.[2] G05F *1/00*

U.S. Cl. 33—361 **5 Claims**



1. Detector means for the detection and electronic reading of the angular position of a magnetic compass, using flux-sensitive means, comprising: a carrying body having a substantially flat and circular surface, said body adapted to be mounted on the exterior top or bottom of a compass, perpendicular to the axis of the compass magnet, the flux sensitive means comprising at least one pair of Hall-elements mounted on said body parallel to said flat surface and symmetrically positioned on a diameter perpendicular to an axis of symmetry of the flat surface, and at least a second pair of Hall-elements substantially are mounted in the same manner as said one pair on the flat surface but at 90 degrees to the line connecting the Hall-elements in the first pair.

4,232,452

APPARATUS FOR USE IN CONNECTION WITH DRY TRANSFER LETTERING AND ANALOGOUS SHEETS

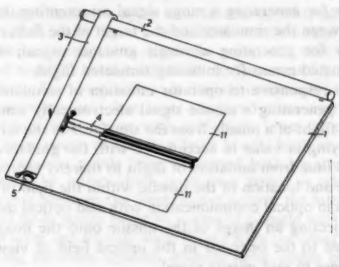
Martin E. Dowzall, Wyckoff, and Vazgen J. Houssian, Union City, N.J., assignors to Letraset International Limited, London, England

Filed Jan. 31, 1979, Ser. No. 8,086

Claims priority, application United Kingdom, Jan. 31, 1978, 3882/78

Int. Cl.[3] B43L *7/00*

U.S. Cl. 33—430 **9 Claims**



1. Apparatus for use in conjunction with a sheet of dry transfer symbols which comprises a baseboard, a horizontal rule mounted thereon and capable of moving both horizontally and vertically, register pins on the rule for registration with predetermined positions on the sheet of dry transfer material, and an upper magnetic clamp adapted to clasp one edge of the sheet of dry transfer material and hold it engaged on the pins, said sheet extending upwardly over the baseboard, and,

a lower magnetic clamp for engaging a second sheet of dry transfer material, said second sheet extending downwardly over the baseboard on the opposite side of the rule, wherein the register pins are pointed and adapted to perforate the sheet of dry transfer material, and said clamps are movable from a first open position to a second closed position and include recesses for engaging said pins in said closed position.

4,232,453

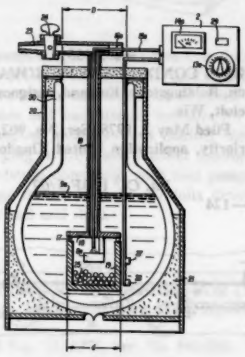
DEVICE FOR FREEZE DRYING AND SYNTHETIC RESIN IMPREGNATION WHEN NECESSARY OF SMALL BIOLOGICAL OBJECTS FOR ELECTRON MICROSCOPIC EXAMINATION

Ludwig Edelmann, Homburg, Fed. Rep. of Germany, assignor to C. Reichert Optische Werke, AG, Vienna, Austria

Filed Sep. 25, 1978, Ser. No. 945,372

Int. Cl.[3] F26B *13/30*

U.S. Cl. 34—92 **13 Claims**



1. A device for freeze drying and synthetic resin impregnation of biological specimens which comprises a Dewar flask for holding a cooling liquid, a sealable container, support means for supporting said container in said Dewar flask below the liquid for cooling said container, valve means for connecting said container to a source of reduced pressure for evacuating said container, a sample tray having at least one recess for receiving a biological specimen, means for supporting said tray within said container spaced from the container interior and heating means for warming said tray.

4,232,454

VARIABLE AIRFLOW HAIR TREATMENT DEVICE

William E. Springer, Bridgeport, Conn., assignor to Clairol Incorporated, New York, N.Y.

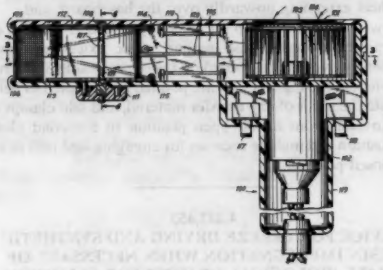
Filed Jun. 14, 1979, Ser. No. 48,323

Int. Cl.[3] A45D *20/12*

U.S. Cl. 34—97 **3 Claims**

1. A hair treatment device having a housing defining a handle, an air conduit, an air inlet and an air outlet and having disposed in the housing a fan for blowing air out of the air outlet and against a person's hair; a heater for heating the air before it is blown out of the device; a pair of trap doors positioned in the air conduit intermediate the heater and the air outlet for controlling the airflow velocity; and means for adjusting the opening between the front ends of the trap doors by controlling the trap doors' movement comprising a knob

which rotates a screw connected to each trap door through holes therein containing female threads, said screw having



left-hand threads on one end portion and right-hand threads on the other end portion.

4,232,455

DRYER DRUM CONDENSATE REMOVAL APPARATUS

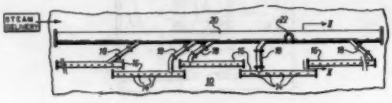
Frank Burton, Baldingstone, England, assignor to Beloit Corporation, Beloit, Wis.

Filed May 2, 1978, Ser. No. 902,169

Claims priority, application United Kingdom, Dec. 3, 1977, 50440/77

Int. Cl.³ F28F 5/02

U.S. Cl. 34—124 **1 Claim**



1. A dryer drum for a paper making machine comprising in combination:

a rotary mounted hollow cylindrical drum shell with supporting end heads;

means for delivering steam into the interior of the shell for heating the shell and with condensate forming on the inner surface of the shell;

a plurality of relatively short length headers extending generally axially within the drum and uniformly spaced from each other around the circumference of the drum overlapping at their ends;

a row of dipper straws projecting radially outwardly from each of the headers and relatively uniformly spaced therealong with open ends positioned adjacent the inner surface of the shell for withdrawing condensate through the straws up into the headers;

means rigidly mounting the headers in their respective positions to the inner surface of the shell;

means for adjusting the position of the open end of the straws so as to position them uniformly spaced from the inner surface of the shell to maintain a uniform thickness in the layer of condensate rimming the shell surface;

a conduit means extending from within the shell to the exterior thereof for removal of condensate;

and flexible tubes connecting each of the headers to the conduit means for conducting the condensate from the headers to the conduit.

4,232,456

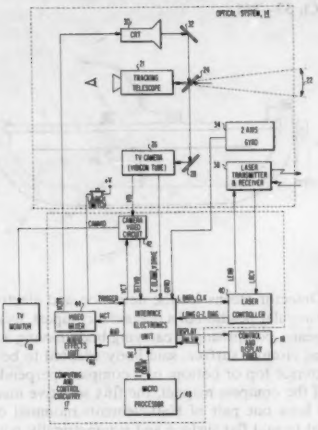
WEAPONS SYSTEM SIMULATOR AND METHOD INCLUDING RANGING SYSTEM

George L. Harmon; Ronald D. Monroe, both of Winter Park; Thomas M. Munday; Clarence E. Jones, both of Orlando, and Edward B. Baker, Maitland, all of Fla., assignors to Martin Marietta Corporation, Bethesda, Md.

Filed Jun. 30, 1977, Ser. No. 811,713

Int. Cl.³ F41J 5/08

U.S. Cl. 35—25 **22 Claims**



1. A weapons simulator for training an operator in the use of a weapons system comprising:

operator positionable optical means for viewing a predetermined field of view;

first and second optically detectable markers positioned on a target remote from said optical means and having a predetermined spacing therebetween;

means in optical communication with said optical means for scanning the field of view in accordance with a predetermined scanning pattern and generating a first video signal representing an image within the field of view including the target and the first and second markers;

means responsive to the video signal from said scanning means for detecting said markers and generating a target signal representing the position of the target in relation to the predetermined scanning pattern;

means for generating a range signal representing the range between the simulator and the target in the field of view;

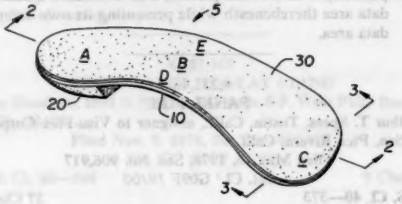
means for generating a missile guidance signal; operator actuated means for initiating simulated flight;

means responsive to operator initiation of simulated flight for generating a missile signal electronically simultating the flight of a missile from the simulator to the target and varying in value in accordance with the guidance signal and time from initiation of flight to thereby represent the size and location of the missile within the field of view;

means in optical communication with said optical means for projecting an image of the missile onto the image presented to the operator in the optical field of view in response to said missile signal;

means responsive to said target, range and missile signals for generating a kill signal related to the proximity of the target and the simulated missile in the field of view a predetermined time after initiation of the simulated flight.

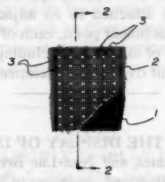
4,232,457
ORTHOTIC INSERT
Mitchell R. Mosher, 120 Ascot Dr. #D, Roseville, Calif. 95678
Filed Jan. 31, 1979, Ser. No. 8,025
Int. Cl.[2] A43B *13/40, 7/22*
U.S. Cl. 36—44 4 Claims



1. An orthotic insert comprised of a plastic support member adapted to extend beneath the heel and arch of a user's foot, terminating at points proximal to the user's metatarsal heads; and,

a heel post mounted on the lower surface of said support member at the heel region; wherein said support member is formed of incompressible, flexible, resilient plastic sheet; said heel post is formed of a compressible, resilient material; said plastic sheet is molded to provide a rise of about 1/8" in the matatarsal arch and, when assembled with said heel post, to provide a rise of about 1" at the flange of the medial longitudinal arch, a rise of about 7/16" at the lateral longitudinal arch, and a 4°–5° varus at the heel; and said heel post is approximately 3/16" at its thinnest point.

4,232,458
SHOE
Bruce E. Bartels, Cambridge, Canada, assignor to Wheelabrator Corp. of Canada, Ontario, Canada
Filed Mar. 13, 1978, Ser. No. 886,042
Int. Cl.[2] A43B *23/00*
U.S. Cl. 36—45 15 Claims

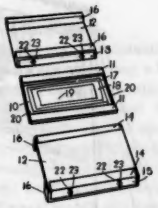


1. A shoe including an upper in which the upper is fabricated at least substantially from a breathable fabric comprising a woven fabric face layer having bulky warp and weft threads interlaced to define cross-over points, and a woven fabric back layer having fine warp and weft threads interlaced to define cross-over points, said face layer at spaced cross-over points thereof being interwoven with said back layer to provide discrete tie-in points of said face layer to said back layer, said spaced cross-over points being separated both longitudinally and laterally by intermediate cross-over points at which no interweaving between the fabric layers occurs, the interweaving at said tie-in points being by means of a single weft thread from one layer and a single warp thread from the other layers, the spacing between adjacent discrete tie-in points being at least 2/16" and not greater than 9/16" and sufficiently close to provide that the layers always remain in contact with each other over the whole area of their adjacent surfaces and have substantially no relative movement in use, and whereby said layers retain their separate identities and said fabric, when viewed from said face layer side, generally not having an interwoven appearance.

4,232,459
SKI BOOTS
Franco Vaccari, Via Paleoveneti 3/3, Montebelluna, Treviso, Italy
Filed Oct. 30, 1978, Ser. No. 956,294
Claims priority, application Italy, Nov. 2, 1977, 22634/77[U]
Int. Cl.[3] A43B *19/00, 7/06*
U.S. Cl. 36—71 3 Claims

1. A ski boot comprising a shell, an inshoe within said shell, a bladder member between said shell and said inshoe, pumping means incorporated within said shell, a delivery valve between said pumping means and said bladder member for delivering air from said pumping means to said bladder member, and means for discharging air from said bladder member, wherein said bladder member is connected with said pumping means and said discharge means through conduits developing between said inshoe and said shell.

4,232,460
MAGNETIC PRESS AND REFRESHER FOR CLOTHES
Lester S. Krulwich, 241 Central Park West, New York, N.Y. 10024
Filed Sep. 11, 1978, Ser. No. 940,906
Int. Cl.[3] D06F *69/00*
U.S. Cl. 38—1 R 5 Claims



1. A magnetic press and refresher for clothes apparatus comprising a flat, thin rectangular member, partially pliable, containing thin, flat flexible magnetic tape attached adjacent to each of the longitudinal edges of its surface, the base of said tapes being lowered so that their surfaces are even with the surface of said rectangular member, and a flat, thin backing of the same size as said rectangular member, provided with magnetically attractable strips movably set on each of the longitudinal sides of said backing on a base lowered from its surface, with said strips adjustably engaging extensions fastened to the other side of said backing enabling said strips to be raised and lowered from the surface of said backing, and capable of magnetically adhering on said magnetic tapes, thereby holding

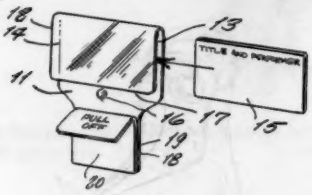
clothes placed between said backing and rectangular member and allowing said clothes to extend out on all sides.

4,232,461

PHONOGRAPH RECORD ALBUM INDEX TABS

Larry B. Crawford, 5959 S. Van Ness Ave., Los Angeles, Calif. 90047

Filed Mar. 19, 1979, Ser. No. 21,841
Int. Cl.³ G09F *3/16*
U.S. Cl. 40—23 A **5 Claims**



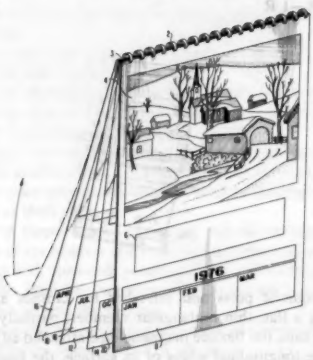
1. A record index tab for a phonograph record album, comprising, in combination, an upper part folded over, so as to form a flat pocket, receiving a card serving as a label, and a lower part coated with adhesive, on one side, for adhering to said album, and said tab being made of transparent, relatively stiff plastic sheeting material; said parts being pivotally connected together by said lower part having a rolledover upper end inserted in a slot near a lower edge of said upper part; a dimple pressed on one side of said upper part intercepting an entrance of said pocket; and stop and snap means, whereby said upper part is pivotably snapped between an upwardly vertical and an angularly upwardly inclined positions.

4,232,462

CALENDARS

Lineaus W. Longenecker, R.D. 5, Manheim, Pa. 17545

Division of Ser. No. 614,817, Sep. 18, 1975, Pat. No. 4,055,011.
This application Dec. 3, 1976, Ser. No. 747,156
Int. Cl.³ G09D *3/04*
U.S. Cl. 40—119 **5 Claims**



1. A calendar, comprising,

a base sheet having a picture thereon in the form of a landscape scene, said base sheet having thereon opaque calendar data areas which bear calendar data,

an overlay sheet having a transparent area movable to overlie the picture on the base sheet, overlay picture portions in said transparent area which register with and obscure portions of said picture on said base sheet, said overlay picture portions depicting vegetation associated with the season of the calendar data area of the respective overlay sheet,

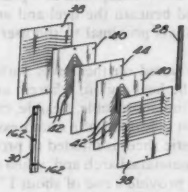
opaque calendar data areas carried by said overlay sheet and located in register with corresponding said opaque calendar data areas; whereby the placement of a transparent overlay sheet over the calendar serves to add overlay picture portions to the picture, and to obscure a calendar data area therebeneath while presenting its own calendar data area.

4,232,463

PANEL FILE

Arthur T. Spees, Tustin, Calif., assignor to Visu-Flex Corporation, Pico Rivera, Calif.

Filed May 16, 1978, Ser. No. 906,917
Int. Cl.³ G09F *19/00*
U.S. Cl. 40—373 **27 Claims**



1. A device for the storage of flat, flexible data elements, comprising:

a plurality of horizontal strips of resilient material arranged to form a layered panel, at least some of said strips each having an upper margin which overlaps a portion of an adjacent strip in said panel; and

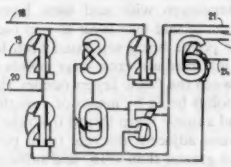
a flexible sheet underlying and attached to said panel and having a plurality of inverted "V"-shaped cuts forming a plurality of inverted "V"-shaped straps, at least some of said straps each having a vertex attached to one of said strips below said overlapping upper margin, each of said straps which is attached to an adjacent strip being attached at an attachment point, each of said strips which is attached to one of said straps including means for guiding said data element over said attachment point.

4,232,464

METHOD FOR THE DISPLAY OF INFORMATION

Rene Besson, Neuchatel, and Jean-Luc Breguet, La Chaux-de-Fonds, both of Switzerland, assignors to Ebauches S.A., Neuchatel, Switzerland

Filed Feb. 15, 1978, Ser. No. 877,854
Claims priority, application Switzerland, Feb. 18, 1977, 2039/77
Int. Cl.³ G09F *9/35*
U.S. Cl. 40—451 **4 Claims**



1. A method for the display of information, especially for watches, using a display device of the type comprising several

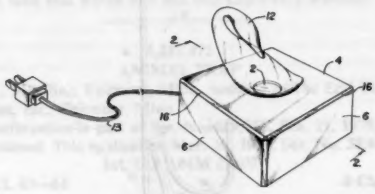
elements arranged in a rectangular formation, said elements being separately activatable, at least a group of at least two of said elements being required to be activated to effect the said display, said method comprising the steps of: activating a first element; and activating at least one selected element to said first element in one of three directions of reading namely left to right, top to bottom and top to bottom and left to right in a diagonal direction.

4,232,465

ILLUMINATED DISPLAY STAND

Ione Stoddard, 1501 S. Flagler Dr., Suite 8-F, West Palm Beach, Fla. 33401

Filed Nov. 9, 1978, Ser. No. 959,403
Int. Cl.³ G09F *13/18*
U.S. Cl. 40—546 **9 Claims**



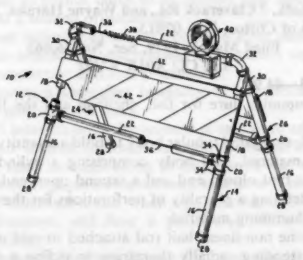
1. An illumiated stand for displaying transparent objects which are placed thereon, comprising,
a light source,
an enclosure for said light sorce, said enclosure having a top wall located in a substantially horizontal plane spaced above said light source, said enclosure including side walls laterally enclosing said light sorce, said top wall having an opening in the path of light from the light source so that a transparent object placed over said opening will be internally illuminated,
at least one of said walls including a piece of light-conducting material which has a light-receiving edge in the path of light from the light source and a light-emitting edge which is visible from the exterior of the enclosure to provide the stand with an illuminated edge, whereby said light source produces the illumination of both said illuminated edge and an object placed on said top wall over said opening.

4,232,466

COLLAPSIBLE DISPLAY FRAME

Terry S. Mathis, R.R. 2, Box 332A, Galena, Kans. 66739

Filed Dec. 13, 1978, Ser. No. 969,290
Int. Cl.³ G09F *15/00*
U.S. Cl. 40—606 **4 Claims**



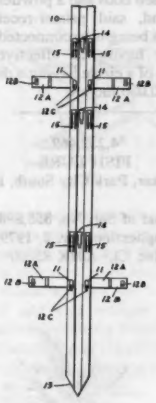
1. Apparatus for holding a display panel comprising:
first and second spaced apart leg supports,
each of said supports comprising first and second tubular members and a T-coupling joining said members;
third and fourth spaced apart leg supports;
first and second Y-couplings for coupling said first leg support with said third leg support and said second leg support with said fourth leg support;
a line extending through said first and second leg supports and having a segment passing through said member couplings and between said first and second leg supports; and
tensioning means coupled with the ends of said line for holding said line under tension,
said first and second leg supports being removable from said Y-couplings whereby they may be positioned in folded relationship next to said third and fourth leg supports and held in said folded position by said line.

4,232,467

SIGN SUPPORT STAKE

Robert Stewart, 12360 Riverside Dr., North Hollywood, Calif. 91607

Filed May 26, 1978, Ser. No. 909,939
Int. Cl.² G09F *07/20*
U.S. Cl. 40—607 **2 Claims**



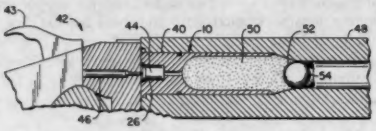
1. A sign support stake comprising:
an elongated member having a substantially hat-shaped configuration in cross-section forming a U-shaped center section with a depending flange extending laterally from each side of said center section, said U-shaped center section having an irregularly shaped opening, each said depending flange having an upright projection;
a longitudinal brace member being secured to said elongated member in a crossed configuration, said brace member having substantially equal length sections extending from said elongated member, each said section having a hook projecting therefrom, whereby a separate sheet sign structure is to be capable of being supported by said hook projections on one side of said elongated member with another sheet sign structure to be capable of being supported by said upright projections on the opposite side of said elongated member; a fastener to connect with said irregularly shaped opening, said fastener to extend through an opening in said another sheet sign structure and secure such to said elongated member, said fastener having a plurality of matching sets of apposing notches, a particular said matched set of apposing notches is to interconnect with said irregularly shaped opening for a particular thickness of said another sheet sign structure.

4,232,468

COMBINATION BREECH-LOADING TO MUZZLE-LOADING FIREARM CONVERTING DEVICE AND PROJECTILE CASING

Paul D. Chapin, 1936 Fifth St., Ceres, Calif. 95307

Filed Apr. 12, 1979, Ser. No. 29,184
Int. Cl.³ F41C *21/10*
U.S. Cl. 42—77 **6 Claims**



1. A device for removable insertion into a breech of a standard, unmodified, breech-loading firearm, the device being alternately usable as a preloaded, projectile-containing casing or for converting said firearm to one of a muzzle-loading variety, the device comprising:

a cylindrically shaped body member having opposed ends and an outer surface configured for mating engagement with the interior of the breech of said firearm, the body member being formed with a primer-receiving chamber at one of said opposed ends and a powder charge chamber at the opposite end, said primer-receiving and powder charge chambers being interconnected by a fluid communicating passage having an effective section generally equal to the area of a circle having a diameter in the range of 0.061 inches–0.080 inches.

4,232,469

FISH LURE

Howard P. Shiverdecker, Park City South, Lot 132, Bloomfield, Ill. 61701

Continuation-in-part of Ser. No. 855,898, Nov. 30, 1977, abandoned. This application Apr. 2, 1979, Ser. No. 25,798
Int. Cl.³ A01K *85/00*
U.S. Cl. 43—42.27 **1 Claim**

1. An artificial bait for use in fishing comprising a bouyant plug and a body, said body being secured to said plug to simulate the appearance and movement of a non-aquatic bird in the water, said body including an upper body portion having wings formed of a resilient flexible material cantilevered outwardly therefrom, and a lower body portion having feet and tail feathers formed of said resilient flexible material cantilevered outwardly therefrom, said plug having a bottom plug surface having a generally flat section for floating in the water, and a recessed plug section at its rearward end, a hook being attached to said recessed plug section to orient said plug at a slight angle relative to the surface of the water to submerge at least a part of said lower body portion including said feet and tail feathers, and to place said upper body portion including said wings at least partially above the water's surface, a line-receiving eyelet attaching to said bottom plug surface approximately mid-way therealong adjacent said flat section for retrieving said artificial bait through said water at said slight angle relative to the water's surface, whereby said resilient feet and tail feathers flex and move beneath the surface of the water with the movement of said artificial bait while floating or being retrieved through the water, and said flexible wings disposed on the water's surface intermittently contacting the surface in a fluttering and flapping motion in response to movement of said artificial bait while floating or being retrieved through the water to simulate the movement and appearance of a non-aquatic bird in the water.

4,232,470

FISH HOOK

Joe A. Steffick, Jr., 2 Millbrook Rd., Bridgeport, W. Va. 26330

Filed Jan. 17, 1979, Ser. No. 4,212
Int. Cl.³ A01K *83/00*
U.S. Cl. 43—43.16 **3 Claims**

1. A fish hook, comprising:

an elongated shank,

a first generally U-shaped loop portion having one end thereof connected to the lower end of said shank, the other end of said loop portion extending upwardly toward said shank,

a second generally U-shaped portion connected at one end thereof to the other end of said loop portion and being spaced from said shank a distance less than the thickness of said shank, said second U-shaped portion being curved in a reverse manner to that of said loop portion, the other end of said second U-shaped portion extending downwardly in generally parallel relation to said other end of said loop portion and being spaced therefrom a distance greater than the thickness of said shank,

a generally U-shaped hook portion connected to the other end of said second U-shaped portion,

whereby the eye portion of a second hook or lure may be fitted over said hook portion, passed through said second U-shaped portion, and snap-fitted between said second U-shaped portion and said shank into said loop portion so as to be removably connected to said fish hook.

4,232,471

CRABBING CHUM LURE

Glenn R. Kolk, 7 Claverack Rd., and Wayne Haraka, 338 Grove St., both of Clifton, N.J. 07013

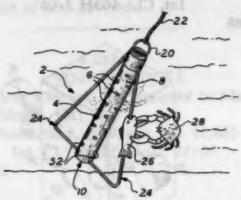
Filed Mar. 1, 1979, Ser. No. 16,663
Int. Cl.³ A01K *97/02*
U.S. Cl. 43—44.99 **10 Claims**

1. A chumming lure for fish, shellfish and the like which comprises:

a central, elongated tubular body to hold a quantity of chumming material, said body comprising a cylindrical side wall, a first closed end and a second open end, said side wall defining a plurality of perforations for the release of said chumming material;

at least one non-linear bait rod attached to said closed end and extending radially therefrom to define a distal free end, said at least one bait rod adapted to impale and retain whole bait thereon;

a removable cap provided to sealingly engage said open end, said cap including an upstanding eye projecting away from said body, said eye providing attachment means for said lure to a control line or the like; and



means for securing said cap and the free end of said at least one bait rod to said body to prevent the premature escape of both said whole bait and said chumming material.

4,232,472

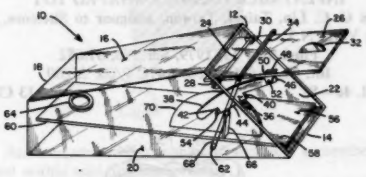
ANIMAL TRAP

Earl L. Muelling, Fairmont, Minn., assignor to The Earl Enterprises, Inc., Fairmont, Minn.

Continuation-in-part of Ser. No. 879,258, Feb. 21, 1978, abandoned. This application Mar. 30, 1979, Ser. No. 25,470

Int. Cl.³ A01M *23/02*

U.S. Cl. 43—61 **4 Claims**



1. An animal trap, comprising:

(a) a housing having a generally rectangular bottom member of a first predetermined length, a generally rectangular top member of a second predetermined length less than said first predetermined length, a rectangular end member extending perpendicularly from one end edge of said bottom member and joining said top member at a corresponding end edge thereof and first and second parallel and spaced apart irregularly shaped, four sided, polygonal, side members joining said bottom, top and end member along opposed edges thereof so that said top member slopes toward said bottom member, said housing having a door opening extending obliquely between the other end edges of said bottom and top members and conforming to an open edge of said polygonal side members;

(b) a door member pivotally secured between said side members of said housing to completely seal said door opening in a substantially air-tight fashion when in a first orientation and to permit entry of an animal into said housing when in a second orientation;

(c) resilient means coupled between said door member and said side members of said housing for normally urging said door member to said first orientation;

(d) an abutment extending inwardly of said housing from one of said side members;

(e) a latch member pivotally secured to said door and having first and second abutment engaging notches located at spaced apart locations along its length such that when said first notch engages said abutment, said door is held in said second orientation and when said second notch engages said abutment, said door is positively held in said first orientation;

(f) an elongated platform having first and second ends disposed within said housing with said first end proximate said door opening near said bottom member, the platform being removably attached to a pivot member located intermediate said first and second ends of said platform and having a bait receiving area proximate said second end; and

(g) a generally rectangular trip member having a first end edge attached to said platform between said pivot and said first end of said platform and extending generally perpendicularly therefrom and having a second end edge adapted to engage said latch member when said second end of said platform member is rotated toward said bottom member for releasing said first notch from engagement with said abutment and allowing said resilient means to urge said door member into said first orientation with said second notch engaging said abutment, said second end edge of said trip member preventing engagement between said first notch of said latch member and said abutment when said second end of said platform is in its rotated position toward said bottom member.

4,232,473

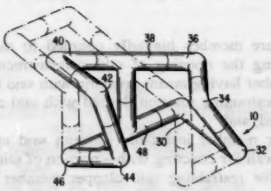
RECONFIGURABLE LOOP OF TUBULAR ELEMENTS

Sherman Jenkins, 1401 Columbus Ave., Livermore, Calif. 94550

Filed Apr. 10, 1978, Ser. No. 895,007

Int. Cl.³ A63H *33/00, 33/08, 33/06*

U.S. Cl. 46—1 R **4 Claims**



1. A twistable novelty device consisting of:

six rigid tubular elbows each having a generally L-shaped configuration rotatably connected end to end forming a single closed loop structure, each abutting pair of elbows being mutually rotatable about the axis common to the abutting ends of said pair without axial displacement therebetween, said elbows being joined together to form a structure in which each leg of the elbows lie in one of two generally perpendicular intersecting planes.

4,232,474

TOY SAFE WITH ALARM

Robert F. Dyer, Rancho Palos Verdes, Calif., assignor to Mattel, Inc., Hawthorne, Calif.

Filed Feb. 16, 1979, Ser. No. 12,921

Int. Cl.³ A63H *33/00*

U.S. Cl. 46—2 **4 Claims**

1. In a toy safe, the combination comprising:

a generally box-like housing forming a compartment with a rear wall and a plurality of sidewalls;

an aperture extending through one of said sidewalls;

a clapper member pivotally mounted within said compartment adjacent said aperture, said clapper member having a portion in aligned spaced proximate relation with said aperture, said clapper member having an enlarged main body portion with an opening extending therethrough;

a boss formed on the rear wall of said housing extending through the opening of said main body portion;

a spring member encircling said boss portion and having one end thereof fixed relative to said housing;

an actuating member rotatably mounted on said boss portion and having means for fixing the other end of said spring member thereto, rotation of said actuating member in a first direction storing energy in said spring member;

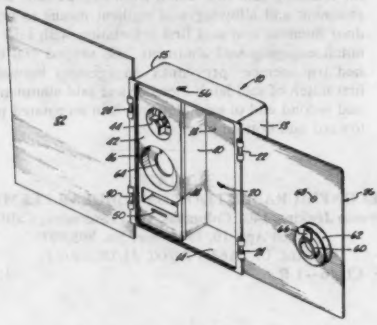
coacting means on said actuating member and said main

body portion for intermittently pivoting said clapper member in response to rotation of said actuating member in and opposite direction under force of said spring member;

a bell member mounted on said boss portion in proximate relation to said clapper member;

means on said clapper member for contacting said bell member in response to said intermittent pivoting;

a handle member coupled to said actuating member for concurrent rotation therewith;



a closure member hingedly coupled to said housing for closing the opening of said compartment, said closure member having means coacting with said handle member for restraining rotation thereof with said closure member closed; and

another member insertable through said aperture in said sidewall for coacting with a portion of said clapper member for restraining said clapper member from pivoting with said closure member open.

4,232,475

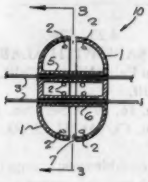
TETHERED TOP USABLE IN TWO WAYS

Harvey E. Bauer, 9124 Thilow Dr., Sacramento, Calif. 95826

Filed Jan. 4, 1978, Ser. No. 866,845

Int. Cl.[3] A63H *1/30, 1/32*

U.S. Cl. 46—61 **2 Claims**



1. A whistling toy comprising a central body element having a substantially oval configuration in cross section and planar vertical faces, a central recess area which defines two symmetrical body portions, edges of said vertical faces sloping towards said recess area due to said oval configuration, said two portions being connected by only two shafts which together form connecting means oblong in transverse section, each shaft disposed on a diametrical line offset from a center of rotation of said toy, and strings inserted within and shafts connected to handle means, and orifices disposed on the sloping edges to provide said whistle by air passing through said orifice whereby said strings are adapted to be removed from within said shafts, a string secured externally to at least one of said shafts and wrapped around said shafts in said central recess area to provide a yo-yo.

4,232,476

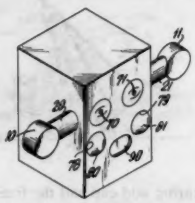
CHILDREN'S MASK

Arthur M. Lieberman, 60 E. 42nd St., New York, N.Y. 10017

Filed Sep. 8, 1978, Ser. No. 940,859

Int. Cl.[3] A63H *3/06*

U.S. Cl. 46—88 **1 Claim**



1. In a children's mask the combination comprising a plurality of bladders mounted on said mask for changing the size of the accompanying portions of said mask; a mouthpiece having a plurality of apertures mounted on said mask, and a plurality of flexible tubes coupling said apertures to said bladders whereby the tongue may act as a gate to seal predetermined of said apertures and activate the remaining thereof to expand the associated bladders.

4,232,477

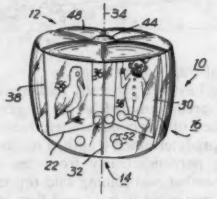
INFLATABLE HASSOCK-SHAPED TOY

Charles C. C. Lin, Taipei, Taiwan, assignor to Shelcore, Inc., New York, N.Y.

Filed May 11, 1979, Ser. No. 37,652

Int. Cl.[3] A63H *3/06;* **A47C** *9/00, 25/00*

U.S. Cl. 46—88 **13 Claims**



1. An inflatable toy, which when inflated has the contour of a hassock, which comprises an envelope, said envelope when inflated being substantially cylindrical with substantially circular and flat top and bottom walls and a substantially cylindrical side wall, said envelope being composed of soft limp flexibe non-resilient sheet material, said envelope having an opening in a wall thereof to enable the envelope to have air under mild pressure introduced into the interior thereof so as to inflate the same, means to selectively close said opening in the wall of the envelope in order to selectively retain air in the envelope and thereby keep the envelope inflated, a plurality of soft limp flexible planar vertical baffles mutually angularly spaced within said envelope, each of said baffles extending radially from near the central axis of said envelope and terminating short of the periphery of said envelope, rectilinear means attaching the top and bottom edges of each of said baffles to the circular top and bottom walls of said envelope, so that the top and bottom walls of said envelope, when said envelope is inflated, have a contour with a central outward bulge and discrete radial outward bulges between adjacent rectilinear attachment means, said baffles being tautened by outward force exerted on the top and bottom walls between the baffles by the pressure of the inflating air, said baffles being spaced from and free of attachment to the substantially cylindrical side wall of said envelope, so that the side wall of said envelope, when said envelope is inflated, has a horizontally outwardly

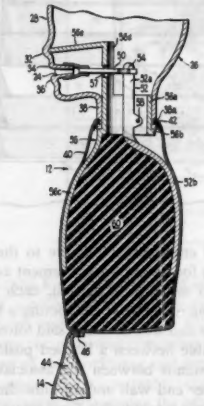
bulging barrel-shaped contour, and at least one discrete solid object within said envelope, the inner edges of adjacent baffles being spaced apart when the envelope is inflated, said object being sized to pass between the inner edges of adjacent baffles to the central axis of said envelope.

4,232,478

ANIMATED DOLL

Rouben T. Terzian, Chicago, Ill., assignor to Marvin Glass & Associates, Chicago, Ill.

Filed Feb. 9, 1979, Ser. No. 10,835
Int. Cl.³ A63H *13/02, 11/00*
U.S. Cl. 46—141 **8 Claims**



1. An animated doll capable of suckling a member telescoped within said doll comprising:

a body having a head with a face including a mouth defined by spaced apart lips formed of flexible material and a tubular mouth sleeve extending from said lips inwardly into the interior of said head;

manually operable means connected to said lips and said mouth sleeve behind said face, said manually operable means being reciprocally movable to move said lips inwardly and outwardly with respect to said face in a suckling type action and to move said mouth sleeve generally in a direction parallel to its axis, said operator means including a reciprocal actuator, engaging said sleeve;

said head including an outer facial wall of thin flexible plastic material, said head being a hollow enclosure having stiffening means internally of said head engaging said facial wall in a position spaced apart from said mouth for preventing retractive movement of said facial wall away from said mouth when said actuator is operatively moving said tubular mouth sleeve inwardly and outwardly; and

means connected to said body for defining a member for insertion within said tubular mouth sleeve of said doll during the reciprocal movement of said lips.

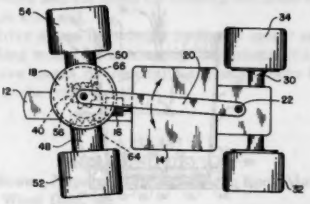
4,232,479

TOY RACING CAR

Emil H. von Winckelmann, 7731 Amestoy St., Van Nuys, Calif. 91406

Filed Oct. 5, 1978, Ser. No. 948,688
Int. Cl.³ A63H *17/36*
U.S. Cl. 46—262 **5 Claims**

1. A toy car including: a chassis; an electrically energized drive motor mounted on the chassis and having a drive shaft; a plurality of wheels for the car mounted on the chassis; an axle for supporting two of the wheels at the respective ends thereof, each of said wheels including a hub clamped to the axle and each of the hubs having a gear affixed thereto; means for mounting the axle on the chassis for angular movement thereof about a vertical axis for steering purposes; and means including a gear train coupling the drive shaft of the motor to the axle for transmitting forward motion to the car and for causing the axle to turn angularly in one direction of the other about the vertical axis depending upon the direction of rotation of the motor,



said gear train including a drive gear, a pivotally mounted arm supporting the drive gear on its distal end and angularly movable about a pivot axis to cause the drive gear selectively to engage the gears affixed to the hubs of the two wheels, a further gear coaxial with said drive gear and affixed thereto, and gear means coupling the further gear to the drive shaft of the motor.

4,232,480

METHOD AND DEVICE FOR COLORING BULK HYDRO MULCH FIBERS

Otis R. Videen, Roseville, Minn., assignor to Conwed Corporation, St. Paul, Minn.

Filed May 14, 1979, Ser. No. 38,500
Int. Cl.³ A01G *7/00*
U.S. Cl. 47—9 **9 Claims**

1. In the process for preparing a hydraulic mulch wherein defibrated vegetable materials are packaged in a shipping container with a dye, the improvement comprising addition of the dye to the defibrated vegetable material after the defibrated vegetable material is in its shipping container.

4,232,481

CARPET OF VEGETABLE MATTER

Michel C. Chamoulaud, Pont de l'Eyre, 33770 Salles, France

Continuation of Ser. No. 856,569, Dec. 2, 1977, abandoned. This application Jul. 31, 1979, Ser. No. 62,378
Claims priority, application France, Dec. 3, 1976, 76 36574
Int. Cl.³ A01C *1/04*
U.S. Cl. 47—56 **15 Claims**

1. A transportable carpet sheet of grass, said carpet sheet comprising a thin layer of compost consisting essentially of finely crushed and gauged conifer bark the particles of which have a section of not more than 100 sq mm and a diameter of at least 1 mm, and grass having whole roots embedded into the compost to form a supporting fabric therein for the sheet, the sheet thickness being approximately 2 cm.

4,232,482

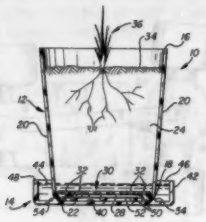
FLOWER POT

Neill H. Watt, and Lynda L. Watt, both of 1815 Valcourt, Richardson, Tex. 75081

Filed Jan. 2, 1979, Ser. No. 74

Int. Cl.[3] A01G *23/02*

U.S. Cl. 47—71 **1 Claim**



1. A container assembly for growing and transplanting plants comprising, in combination, a pot having an open top end, an open bottom end, an upwardly flaring conical sidewall disposed between the top and bottom ends, and an annular flange projecting into the interior of said pot from the sidewall near the bottom end defining the open bottom end, said flange being inwardly, radially spaced from said sidewall; bottom disc removably supported on the annular flange within the interior of said pot and covering the open bottom end, said bottom disc having at least one drainage opening overlying the open bottom end for permitting water to drain from soil enclosed within said pot through the open bottom end, and said bottom disc being upwardly movable through said pot for displacing a volume of soil and a rooted plant through the top opening without disturbing the soil surrounding the roots of the plant; a tray for supporting said pot in an upright position, said tray having a closed bottom panel and an upturned sidewall projecting from the closed bottom panel, said tray bottom panel, tray sidewall and pot sidewall defining an open annular reservoir space between the sidewall of the tray and the sidewall of the pot when the pot is received within the tray; and, interlocking support means mounted on said pot and on said tray for centering and removably supporting the open bottom end of said pot above the bottom panel of said tray and below the top of the tray sidewall and for providing fluid communication between the open reservoir space and the intermediate opening, said interlocking support means including a circular array of axially projecting feet depending from said flange, said feet being spaced relative to each other thereby defining a flow passage between adjacent feet, and a circular array of elongated, curved ridge segments projecting upright from the tray bottom panel, said curved ridge segments being spaced relative to each other thereby defining a flow passage between adjacent ridge segments, the circular array of axially projecting feet being concentrically aligned with the circular array of ridge segments, said axially projecting feet and ridge segments being engageable to define a male and female connection for securing said pot into engagement with said tray.

4,232,483

HINGED LOUVERED WINDOW SHADE DEVICE

Robert Lockshin, 2025 NE. 154 St., North Miami Beach, Fla. 33162

Continuation of Ser. No. 754,558, Dec. 27, 1976, abandoned, which is a continuation-in-part of Ser. No. 659,599, Feb. 20, 1976, abandoned. This application Sep. 21, 1978, Ser. No. 944,337

Int. Cl.[2] E05C *7/02*

U.S. Cl. 49—67 **7 Claims**

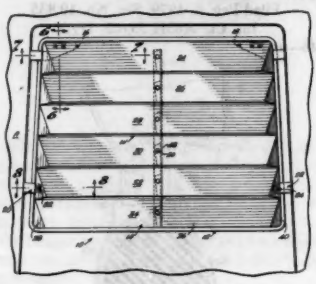
1. A louvered window shade device for mounting relative to the window in the rear door of an automobile comprising:

a main body assembly having a top edge portion and a lower portion and being comprised of a plurality of interconnected horizontally disposed louvers, each louver including an elongated transverse top wall and a pair of opposed end walls,

mounting means including a pair of top mounting assemblies and a pair of lower mounting assemblies,

each of said pair of top mounting assemblies including hinge means connecting to said top edge portion and clamp means for fixed engagement relative to the existing peripheral door flange, and

each of said pair of lower mounting means including clamp



means for fixed engagement relative to the door flange and latch means for selective engagement and disengagement relative to said lower portion, each of said latch means comprising a latch pin connecting a lower mounting means and an end wall of one of said louvers, said latch pin being rotatable between a latched position at which the latch pin extends between the associated mounting means and louver end wall and an unlatched position at which the latch pin is removable from between the associated mounting means and louver end wall.

4,232,484

APPARATUS FOR MOVING TOLL BARS OR THE LIKE

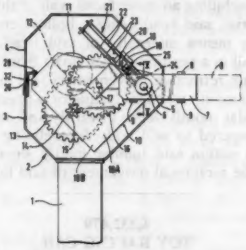
Hans Buchmann, Oetwil, Switzerland, assignor to Zublke Engineering AG, Schlieren, Switzerland

Filed Dec. 20, 1978, Ser. No. 971,356

Claims priority, application Switzerland, Dec. 21, 1977, 015788/77

Int. Cl.[3] E05F *15/02, 15/10;* E01F *23/00*

U.S. Cl. 49—334 **11 Claims**



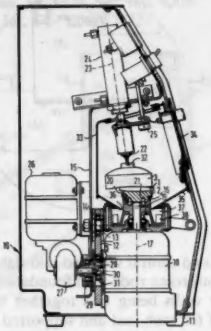
1. In a tollgate or the like, the combination of a support; a bar mounted on said support and movable between a first and second end position; and means for moving said bar between said end positions, including a prime mover and a swinging crank guide transmission having an input element connected with said prime mover and an output element connected with said bar, one of said elements including a pivotable crank guide and the other including an orbiting crank portion guided by said crank guide.

4,232,485

APPARATUS FOR POLISHING CURVED SURFACES

Stuart Eadon-Allen, Birmingham, England, assignor to Dollond & Aitschison (Services) Limited, Birmingham, England

Filed Aug. 11, 1978, Ser. No. 933,453
Claims priority, application United Kingdom, Aug. 13, 1977, 34083/77
Int. Cl.³ B24B 13/02
U.S. Cl. 51—55 6 Claims



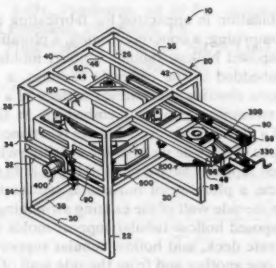
1. A combination for polishing curved surfaces comprising a workpiece and a polishing tool having complementary part-spherical surfaces and apparatus for rubbing said surfaces together, wherein the apparatus comprises first carrying means for carrying one of the workpiece and tool for rotation about a first axis, a support which is movable relative to the first axis, second carrying means for carrying the other of the workpiece and tool for rotation about a second axis, the second carrying means being mounted on the support, fluid biasing means for urging the workpiece and the tool into mutual engagement, driving means for rotating one of the workpiece and tool about its axis and for moving the support whereby the workpiece and the tool are rubbed together, and guide means co-operable with the support for guiding the support and second carrying means for movement such that the second axis moves in a plane, the first axis being inclined at an acute angle to said plane.

4,232,486

TUMBLER-TYPE FINISHING MACHINE

John F. Rampe, Mayfield Heights, Ohio, assignor to Rampe Research, Cleveland, Ohio

Filed Nov. 14, 1978, Ser. No. 960,630
Int. Cl.³ B24B 31/02
U.S. Cl. 51—164.1 24 Claims



1. A tumbler apparatus, comprising:

(a) a drum defining a chamber adapted to receive finishing media and workpieces to be finished, the drum being rotatable about a rotation axis;

(b) a framework supporting the drum for rotation about the rotation axis;

(c) an upstanding frame supporting the framework for movement about a pivot axis for positioning the drum rotation axis in selected orientations;

(d) drum rotation drive means interposed between the framework and the drum for rotating the drum about the rotation axis; and,

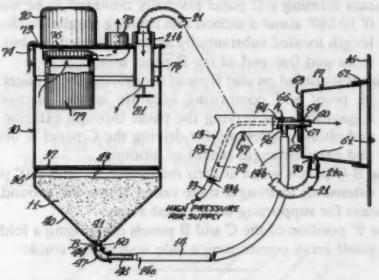
(e) the drive means including a hydraulic motor and shock absorbing means for minimizing the transmission through the drive means of transient loads and shocks from the drum to the framework.

4,232,487

ABRADING DEVICE

Donald J. Brown, Naperville, Ill., assignor to Knox Manufacturing Co., Wood Dale, Ill.

Filed May 25, 1978, Ser. No. 909,537
Int. Cl.³ B24C 3/06, 7/00
U.S. Cl. 51—425 47 Claims



1. A surface treating apparatus comprising a housing containing a supply of abrasive material and having an outlet at the bottom thereof, a gun for directing abrasive material in the direction of a surface area to be abraded and having a passageway defined therethrough, a source of positive pressure air connected to one end of said gun passageway, a conduit having a first end portion connected to said outlet and a second end portion connected to said gun passageway downstream of the connection of said source of positive pressure to said gun, abrasive material from the housing occupying said first end portion under the influence of gravity when the apparatus is inoperative, an aperture formed in said first end portion of the conduit adjacent the abrasive material therein and the housing outlet, the aperture permitting ambient atmospheric pressure to communicate with said conduit downstream to the gun and upstream through said first end portion to the housing only through said outlet, whereby positive pressure air flowing through said gun passageway across the end of said conduit creates a negative pressure in said conduit, the negative pressure in said conduit causing ambient air to flow in through said aperture toward the gun and to draw abrasive material from said first end portion and from said housing through said outlet and to propel said abrasive material to the gun passageway so that positive pressure in said passageway propels the abrasive material onto the surface area.

4,232,488

PORTABLE STAGE

William F. Hanley, c/o Magic Stage, 430 Salem St., Medford, Mass. 02155

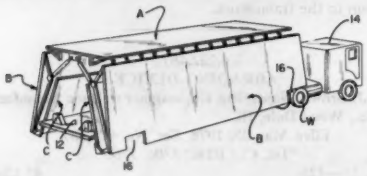
Filed Mar. 30, 1979, Ser. No. 25,329
Int. Cl.² E04H 3/10; A47B 3/00
U.S. Cl. 52—7 17 Claims

1. Portable extendable, wide area apparatus, usable for stages

and the like, mountable on and compressible to an over-the-road truck cross section frame and expandable to a flat staging width on at least one side of the truck of two or more times truck height and comprising,

means forming a B panel arranged to hang vertically and pivot 0°–90° about a first pivotal axis running parallel to the truck length and located at elevation above the truck body and within the said cross section frame thereof and high enough so that the lower free end of the said B panel clears the ground when the panel is vertically arranged (at 0°),

means for driving the B panel about its pivotal axis,



means forming a C panel pivotally mounted to be movable 0° to 180° about a second axis running parallel to the truck length located substantially at and mounted on, but offset from said free end of the B panel and,

means mounted on said B panel for driving the C panel about its pivot and comprising separate means, alternatively engageable, for driving the panel through extreme acute and obtuse angles and for driving the C panel in between said extreme angle ranges of motion,

the B-C panels when at their respective 90° and 180° pivotal extensions forming a stage raised above the ground,

means for supporting such raised stage,

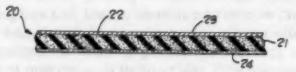
the 0° position of the C and B panels comprising a folded up panel array constituting a side wall of the truck.

4,232,489

SKELETAL FRAME STRUCTURE WITH SHEET MATERIAL COVER

Edward J. Corvington, Cuyahoga Falls, and Elmer J. Sitter, Northfield, both of Ohio, assignors to Royal Mark Laminates, Macedonia, Ohio

Filed Jun. 28, 1979, Ser. No. 53,103
Int. Cl.[2] E04B *1/347;* **B32B** *5/18, 23/00*
U.S. Cl. 52—63 **6 Claims**



1. In a skeletal frame structure including a framework and a flexible cover, the improvement characterized by a protective tape applied to the framework beneath the cover, said tape comprising a laminate of plastic foam and a facing layer of silicone-coated kraft paper, said facing layer being exposed for contact by the cover.

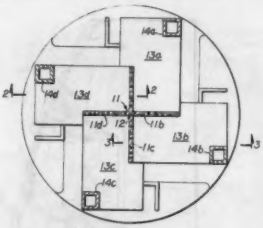
4,232,490

BUILDING CONSTRUCTION FOR MULTIPLE UNITS HAVING COMMON WALLS

Cyril M. Doane, 500 Font Blvd., San Francisco, Calif. 94132

Filed Feb. 5, 1979, Ser. No. 9,442
Int. Cl.[3] E04B *1/98*
U.S. Cl. 52—167 **3 Claims**

1. A multi-unit building comprising a free-standing central wall having a plurality of arms extending radially from a central vertical axis, said central wall comprising the principal support for the entire building and affording seismic protection, sound proofing, heat and sound insulation and fire hazard shielding for said entire building, a plurality of units, each unit extending perpendicularly from one said arm, a concrete slab for each said unit, a concrete-reinforced foundation around the perimeter of said slab including one stretch parallel to each said arm and the front exterior wall on each said one stretch, exterior walls around the perimeter of said slabs supported by said



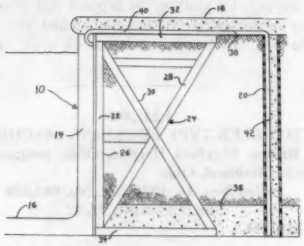
foundations, said central wall and said slabs being tied together with first reinforcing rods, said foundations and said slabs and said exterior walls being tied together by second reinforcements, a roof for each said unit supported by one said arm and by at least some of said exterior walls, said central wall being of masonry construction and being substantially fire, sound and earthquake proof, the exterior walls of individual units being separated from each other by arms of said central wall to reduce likelihood of fire spreading from one unit to another.

4,232,491

SWIMMING POOL DECK

John C. Bumgarner, Sr., 514 N. Crain Hwy., Glen Burnie, Md. 21061

Filed Oct. 10, 1978, Ser. No. 949,537
Int. Cl.[3] E04B *1/35;* **E04H** *3/16, 3/18*
U.S. Cl. 52—169.7 **3 Claims**



1. In combination in apparatus for fabricating a swimming pool deck comprising; a concrete footing, a plurality of spaced vertically disposed hollow tubular support molds filled with concrete, embedded in the concrete footings, a plurality of spaced supports abutting the exterior surface of a side wall of an existing swimming pool and embedded in the concrete footings, and a plurality of vertical plates positioned next to the exterior surface of the side walls of the existing swimming pool and the spaced supports have a vertical leg to hold said vertical plates in place, a plurality of horizontal reinforcing rods extending from the side wall of the existing swimming pool to the vertically disposed hollow tubular support molds to support a poured concrete deck, said hollow tubular support means are speced from one another and from the side wall of the existing swimming pool, each of the horizontal reinforcing rods having a hook portion on one end to engage the top portion of the vertical plates, and an elongated vertically disposed down-

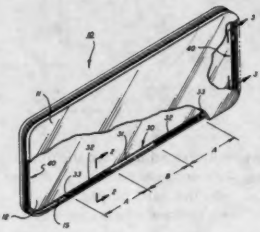
wardly extending L-shaped portion on the other end, said downwardly extending portion embedded in the concrete in the hollow tubular support molds.

4,232,492

DRYING APPARATUS FOR MULTI-GLAZED WINDOW UNIT

David W. Remick, Camillus, and David T. Ahlgren, Syracuse, both of N.Y., assignors to O. M. Edwards Co., Syracuse, N.Y.

Filed Jan. 18, 1979, Ser. No. 4,459
Int. Cl.[3] E06B *7/12*
U.S. Cl. 52—172 **4 Claims**



1. In a multi-glazed window of the type wherein at least two light transmitting panels are mounted in a frame in a spaced-apart relationship and the window is sealed to prevent moisture from entering the atmosphere within the space between the panels, the improvement comprising

an elongated housing extending along one of the margins of the window within the sealed space between the panels, said housing having a bottom wall, side walls and end walls,

a desiccant material evenly dispersed throughout said housing in sufficient quantity to initially dry the atmosphere within the sealed space between the panels upon sealing of the window and to maintain said atmosphere in a dry condition thereafter,

a cover mounted upon the top of said housing having a first open zone containing a plurality of closely spaced holes for exposing the desiccant in this region of the housing to said atmosphere and a second closed zone having an unbroken surface for shielding the desiccant in this region from direct exposure to the atmosphere in the sealed space, and

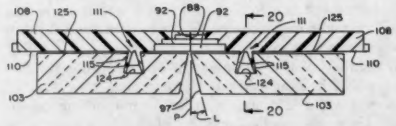
said open zone of the cover containing at least twice the area of the closed zone.

4,232,493

FIRE-RESISTANT ELECTRICAL WIRING DISTRIBUTING FLOOR STRUCTURE AND METHOD

Charles R. Gray, Coraopolis; John O. Hazen, Monaca, and Charles J. Kelly, Pittsburgh, all of Pa., assignors to H. H. Robertson Company, Pittsburgh, Pa.

Filed Apr. 28, 1978, Ser. No. 901,063
Int. Cl.[3] E04C *3/10*
U.S. Cl. 52—221 **12 Claims**



1. In a floor structure of the type comprising a metal subfloor providing generally parallel enclosed cells separated by lengthwise troughs; a covering layer of monolithic concrete supported by said metal subfloor; a housing disposed between said metal subfloor and said concrete, providing a chamber which includes a trough space and which communicates with one of said cells; and a layer of fireproofing material covering the lower surface of said metal subfloor; the improvement comprising:

said layer of fireproofing material having a thickness which is less than that required to provide said floor structure with a desired fire endurance when the housing is activated;

activating means for gaining access to said chamber and for reinstating said desired fire endurance of said floor structure without increasing said thickness of said layer of fireproofing material, said activating means including:

a passageway in said concrete extending between said upper surface of said concrete and said housing, providing access to said chamber,

a removable cover supported in capping relation with said passageway,

a rigid insulation block secured to said cover at a lower face thereof, said rigid insulation block being removably connected to said cover by a dovetail connection, and

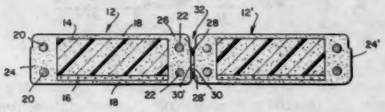
a heat shield positioned within said trough space.

4,232,494

COMPOSITE CONSTRUCTION PANEL

Tamil D. Bauch, Box 394 B, R.F.D. 1, Kingston, N.Y. 12401, and Hank Starr, Kingston, N.Y., assignors to Tamil D. Bauch, Kingston, N.Y.

Filed Apr. 27, 1979, Ser. No. 33,892
Int. Cl.[3] E04B *2/02*; E04C *2/24*; B32B *5/18*
U.S. Cl. 52—221 **10 Claims**



1. A molded composite construction panel formed in a continuous molding procedure and suitable for casting curvilinear structural components comprising a lightweight cellular core of rigid foam material, said core having a cementaceous fireproofing layer interfacially bonded to one side of said core, a relatively thin skin of sprayed glass fiber reinforced concrete encasing said core and fireproofing layer, said panel further including at least one integrally formed lateral rib section of said fiber reinforced concrete, said rib section being coextensive with at least one side of the panel and including connection means for securing adjacently placed panels.

4,232,495

PRECAST UNITS FOR CONSTRUCTING COOLING TOWERS AND THE LIKE

Tung-Yen Lin, El Cerrito, and Yue-Chyou Yang, San Francisco, both of Calif., assignors to T. Y. Lin International, San Francisco, Calif.

Division of Ser. No. 768,175, Feb. 14, 1977, Pat. No. 4,092,811.
This application Nov. 3, 1977, Ser. No. 848,025
Int. Cl.[2] E04C *3/26*
U.S. Cl. 52—224 **4 Claims**

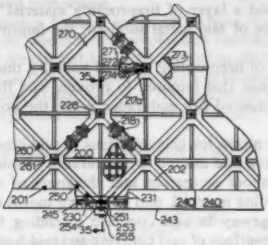
1. A precast unit for constructing cooling towers and the like, comprising:

a quadrilateral reinforced thin skin of concrete, having integral therewith

an edge rib along each edge thereof, each having openings therethrough to enable securement, as by bolting, of a like precast unit thereto, and

a pair of cross ribs crossing diagonally, each having a ten-

don-receiving passage running therethrough at each corner of said unit, the two edge ribs converging there being



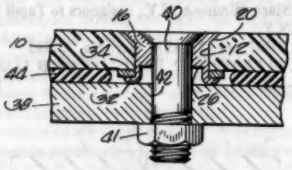
splayed across the corner, leaving the unit only the thickness of said skin outside the splay.

4,232,496

GROMMET ASSEMBLY FOR COMPOSITE PANELS

Roy Warkentin, Lomita, Calif., assignor to Tridair Industries, Milwaukee, Wis.

Filed Apr. 30, 1979, Ser. No. 34,105
Int. Cl.³ E04B *1/66*; F16B *5/02*
U.S. Cl. 52—403 **4 Claims**



1. An assembly for attaching a panel of relatively brittle composite material to a substructure, separated therefrom with a layer of gasket material compressible to a maximum limit, comprising:

(1) aligned circular holes in the panel and the substructure;

(2) the gasket material defining a space radially around the holes and axially between the panel and the substructure;

(3) a structural grommet disposed in the panel hole and having a radially flared end extending into the space for securing the grommet in the panel;

(4) fastening means disposed in the grommet and the hole in the substructure for drawing the panel and substructure together and compressing the gasket material;

(5) spacer means interposed between the panel inner face and the flared grommet end; and,

(6) the spacer means and grommet end having a combined thickness in the axial direction of the space between the panel and substructure greater than the thickness of the gasket material at its limit of maximum compressibility.

4,232,497

DEVICE FOR SECURING PLATELIKE ELEMENTS TO A CARRYING STRUCTURE AT A DISTANCE THEREFROM

Albin Meschnig, Müllnern 72 (Kärnten), A-9585 G dersdorf, Austria

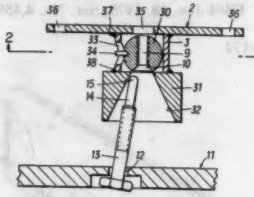
Filed Feb. 21, 1979, Ser. No. 13,654
Int. Cl.³ E04B *1/38*; F16B *39/00*
U.S. Cl. 52—506 **7 Claims**

1. An assembly for securing a panel to a carrying structure, particularly for securing suspended ceilings to an overlying structure, comprising

a carrier means for attachment to a carrying structure, said carrier means being formed with a plurality of apertures,

a nut member pivotally mounted in the carrier means, said nut member being formed with a threaded tapped bore,

a bolt adapted to be passed through an opening in the panel and screwed into the tapped bore of the nut member, the bolt having a cylindrical extension of a diameter smaller than the threaded tapped bore of the nut member and the carrier means having a flared guide means for leading said cylindrical extension into the nut member,



a plurality of pins extending from the nut member constituting means for restricting rotation of the nut member about the axis of said threaded tapped bore,

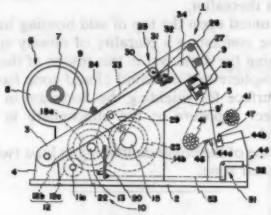
the pins having a clearance fit in said apertures, respectively, in the carrier means are regularly spaced around the nut member, said apertures in said carrier means correspond to the number of said pins.

4,232,498

DEVICE FOR BINDING A THERMALLY ADHESIVE TAPE TO ARTICLES

Hiromichi Uchida, c/o Shin Nihon Seiki Co., Ltd., Hoshino Bldg., 7-3, Ueno 5-chome, Taito-ku, Tokyo, Japan

Filed Jul. 25, 1978, Ser. No. 927,901
Claims priority, application Japan, Jul. 25, 1977, 52-89081
Int. Cl.³ B65B *13/32, 27/10, 57/16*
U.S. Cl. 53—76 **7 Claims**



1. A device for binding thermally adhesive tape around articles to be bundled, said device comprising:

a base frame;

an arm pivoted to said base frame and pivotably movable between a working position and a non-working position, said arm having a free end;

a working head provided on said free end of said arm;

a tape supply mounted on said base frame for supplying a leading end of tape over said free end of said arm;

a working stand mounted on said base frame at a position to be faced with said working head when said arm is pivoted to said working position;

tape holding means, mounted on said working stand, for releasably holding said tape leading end;

whereby, when said arm is in said non-working position, articles to be bundled may be placed in a tape portion extending between said working head and said tape holding means;

said working head including tape bundling means for, upon movement of said arm to said working position, wrapping

said tape portion around said articles to be bundled, holding the thus wrapped tape portion against said working stand, and for releasing said tape holding means from said tape leading end;

heater means, provided on one of said working head and said working stand, for bonding said wrapped tape portion;

cutter means on said working head for cutting the thus bonded and wrapped tape portion from a succeeding portion of said tape, thereby forming a released bundle of said articles;

said working head including tape leading means for leading a new tape leading end from said succeeding tape portion to said tape holding means;

a transmission system for moving said arm from said non-working position to said working position, said transmission system comprising a motor, a first gear group driven by said motor, a second gear group, a clutch between said first and second gear groups, said clutch having an engaged position causing said first gear group to drive said second gear group and a non-engaged position interrupting driving between said first and second gear groups, and arm drive means connected to said second gear group and to said arm for pivoting said arm between said working and non-working positions upon said clutch being in said engaged position and upon driving of said second gear group; and

clutch engaging means for moving said clutch from said non-engaged position thereof to said engaged position thereof and for thereby moving said arm from said non-working position thereof to said working position thereof, said clutch engaging means comprising an article receiving table positioned to receive and entirely support thereon said tape portion and said articles to be bundled, said table being mounted to be depressed upon receipt of said tape portion and articles to be bundled, and lever-linkage means, mounted between said table and said clutch, and operable upon depression of said table, for moving said clutch from said non-engaged position thereof to said engaged position thereof, said lever-linkage means comprising a clutch releasing member mounted for movement between a first position in contact with said clutch and thereby maintaining said clutch in said non-engaged position out of contact with said clutch and thereby and a second position allowing said clutch to move to said engaged position, spring means for urging said clutch to said engaged position, and linkage means connected to said clutch releasing member for moving said clutch releasing member to said second position thereof upon depression of said table.

4,232,499

CAPPER CHUCK

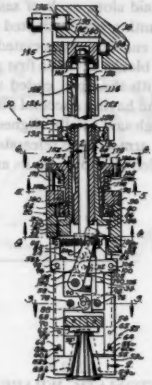
John H. Holstein, 5304 N. Colonial - No. 102, Fresno, Calif. 93704, assignor to John H. Holstein, Fresno, Calif.

Filed Aug. 1, 1978, Ser. No. 930,053

Int. Cl.[3] **B65B** *7/28;* **B67B** *3/20*

U.S. Cl. 53—331.5 **17 Claims**

1. In a capper chuck for applying a closure to a container by effecting relative rotation between the closure and the container, the capper chuck including housing means, gripper jaw means supported by said housing means for movement between an open condition adapted to receive a closure therein and a closed condition adapted to firmly retain the closure, linkage means interconnecting said gripper jaw means and operable to effect movement of said jaw means between said open and closed conditions, and control means mounted on said housing means and operatively associated with said linkage means to release said gripper jaw means from a closure in response to a predetermined rotational torque effected between the closure and an associated container upon relative rotation between the capper chuck and container, the improvement wherein said control means includes control plate means rotatably mounted on said housing means, coaxial with said capper chuck, spring means coaxial with said control plate and connected between said control plate means and said housing means and operative to transmit a predetermined rotational torque to said housing means upon rotation of said control plate means, and an actuating lever mounted on said housing



means for cooperation with said control plate means and said linkage means, said control plate means and actuating lever being operative to effect release of said jaw means from a closure when said predetermined torque is effected between said closure and associated container.

4,232,500

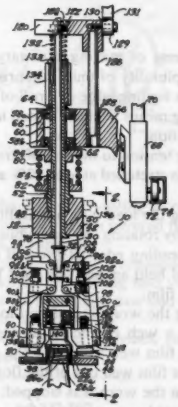
ROLL-ON CAPPER CHUCK

John H. Holstein, 5304 N. Colonial - No. 102, Fresno, Calif. 93704, assignor to John H. Holstein, Fresno, Calif.

Filed Aug. 1, 1978, Ser. No. 930,054

Int. Cl.[3] **B65B** *7/28;* **B67B** *3/18*

U.S. Cl. 53—334 **3 Claims**



1. In a capper chuck apparatus having housing means, at least two support arms pivotally mounted on said housing means, operating means carried by said support arms and adapted to engage a closure disposed between said operating arms, and means operatively associated with said housing means and said support arms and operative to effect pivotal movement of said support arms between first positions wherein said operating means engage a closure disposed therebetween and second positions wherein said operating means are spaced from the closure,

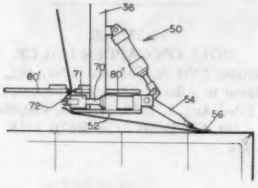
the improvement wherein each of said support arms has a bifurcated end thereon opposite its pivotal connection to said housing means, each of said support arms having a pair of laterally aligned open ended slots formed in its bifurcated end and a pair of axially aligned openings spaced from said slots, each of said operating means including a mounting block adapted to be received within the bifurcated end of the associated support arm, each of said mounting blocks having a first pin therein adapted for registration with the open ended slots in the associated support arm and having a second pin therein adapted to be inserted through said axially aligned openings in the associated support arm so as to releasably retain the operating arm in assembled relation with its associated support arm.

4,232,501

ECONOMY AUTOMATIC WRAPPING APPARATUS

William H. Stackhouse, Pamyra, Ind., assignor to Lantech Inc., Louisville, Ky.

Filed May 1, 1978, Ser. No. 901,634
Int. Cl.[3] B65B *11/04*
U.S. Cl. 53—399 **16 Claims**



1. The process of making a unitary package from a load comprising a plurality of units comprising:

(a) placing a leading edge of a roll of stretchable film from a dispensing means adjacent a load in a clamp to hold it in a fixed position;

(b) applying tension to the roll of stretchable film so that the film web is stretched at least 20% as it is removed from the roll;

(c) wrapping the load with a plurality of layers of stretched film web by rotating the load while removing the clamp so that the leading edge of the roll of stretched film is released and held against said load by an overwrap of said stretched film;

(d) stopping the wrapping of said load;

(e) moving a web extending means into the path of said stretched film web to engage the stretched film web and distort the film web out of the flow path it initially occupied when the wrap was stopped;

(f) clamping at least a portion of the distorted stretched film web in said clamp between the extruding means and the dispensing means;

(g) extending a cutting means mounted to the web extending means into the film web from the same side of the film web that the web extending means engages the film web thereby severing the web without any opposing force on the other side of the film web after the film has been distorted from its initial flow path; and

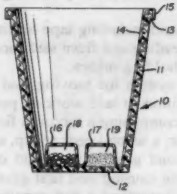
(h) pressing the trailing edge of the film web against an underlying film wrap layer.

4,232,502

METHOD OF MAKING A DRINKING CUP AND CONTAINER

Paul A. Lucas, 2605 St. Clair Ave., East Liverpool, Ohio 43920

Continuation-in-part of Ser. No. 811,432, Jun. 29, 1977, Pat. No. 4,134,492. This application Oct. 5, 1978, Ser. No. 948,893
Int. Cl.[3] A23L *29/02*; B65D *77/00*; B29C *17/08*; B65B *47/00*
U.S. Cl. 53—453 **7 Claims**



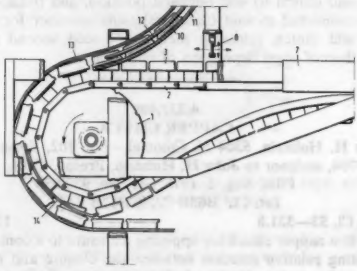
1. The method of making a drinking cup and container comprising positioning a piece of thin flexible plastic film over a shaping form of a predetermined shape incorporating at least one depression in the outer surfaces thereof, moving the film into close engagemment with said outer surfaces of said shaping form, positioning a beverage concentrate or the like in at least one of the depressions defined in said film by said depressions in said shaping form, positioning an expendible cup thereover in sealing relation thereto and removing the excess film around the outside of said cup so that said film forms a liner in said cup with said depressions and said beverage concentrate in the normal bottom of said cup when the same is in upright position.

4,232,503

MACHINE FOR AUTOMATICALLY FILLING CANS

Niels J. Andersen, Broby, Denmark, assignor to Cabinplant A/S, Haarby, Denmark

Filed Mar. 8, 1979, Ser. No. 18,740
Claims priority, application Denmark, Mar. 16, 1978, 1184/78
Int. Cl.[3] B65B *37/16, 63/00*
U.S. Cl. 53—517 **6 Claims**



1. A machine for automatically filling elongated pieces of food-ware in cans, comprising a substantially horizontal endless conveyor chain rotating about a sprocketwheel, each link of said chain carrying a receptacle, each said receptacle being open at its top and at its opposite ends, the outer dimensions of each said receptacle substantially corresponding to the inside dimension of said cans, successive receptacles being lengthwise aligned to form a groove at least through a filling station through which said chain passes; a cutting device arranged to be moved between the adjacent ends of the receptacles; and guiding means for supplying a continuous row of cans having openings facing downward to a location where said conveyor chain initiates a downward movement as it rotates around said

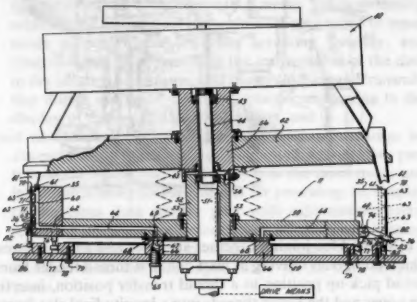
sprocketwheel, said conveyor chain and guiding means approaching one another at said sprocketwheel so that cans from said guiding means are successively caught by respective receptacles and forced down to surround the same and be retained in this position to the lower part of said sprocketwheel.

4,232,504

POUCH FORMING AND FILLING MECHANISM WITH PROVISION FOR INCREASING THE CAPACITY OF THE POUCHES

Paul E. Dieterlen, Covington, Ky., and Harold T. Benner, Jr., Cincinnati, Ohio, assignors to R. A. Jones & Co. Inc., Covington, Ky.

Filed Jun. 12, 1978, Ser. No. 914,426
Int. Cl.³ B65B *43/30, 43/32*
U.S. Cl. 53—570 **12 Claims**



1. In pouching apparatus, a filling mechanism comprising,
a filler wheel assembly,
means for continuously rotating said assembly,
said filler wheel having a filling zone at one arcuate portion of its rotary excursion,
a vacuum transfer wheel mounted below said filler wheel assembly and rotatable therewith,
a plurality of substantially vertical lands circumferentially spaced around said transfer wheel to receive a web of pouches,
means for holding the web on said lands,
a plurality of tuck fingers movably mounted on said transfer wheel between said lands,
a stationary circumferential cam mounted adjacent said transfer wheel,
said tuck fingers being connected to said cam to cause said fingers to move upwardly into contact with the pouches in said web to tuck the bottom of each pouch during at least a portion of the movement of said tuck fingers through said filling zone, thereby increasing the capacity of each pouch.

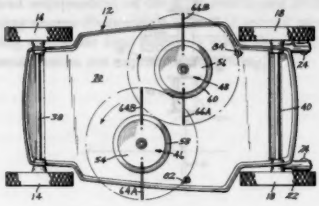
4,232,505

DUAL ELEMENT FILAMENT MOWER

Joseph J. Walto, Chaska, Minn., assignor to The Toro Company, Minneapolis, Minn.

Filed Aug. 9, 1978, Ser. No. 932,353
Int. Cl.³ A01D *35/264*
U.S. Cl. 56—12.7 **8 Claims**

6. A dual element filament mower of the type wherein a plurality of rotating filament mounting elements carrying flexible nonmetallic filament cutting elements which pass through overlapping paths during rotations are affixed to a mower housing having ground-engaging wheels for movement over a ground surface in a preferred direction, wherein the improvement comprises:
means mounting said filament mounting elements with axis of rotation of one element ahead of the other with respect to said preferred direction, and the axes of rotation of both of said elements tipped substantially with respect to the



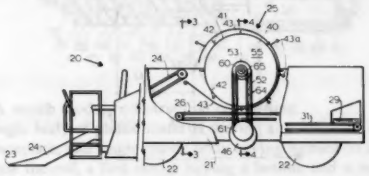
vertical, so that the cutting planes defined by the filaments of each of said mounting elements do not intersect.

4,232,506

METHOD AND APPARATUS FOR RECOVERING TOMATOES FROM SEVERED VINES, EMPLOYING A ROTATED AND OSCILLATED SHAKER

Henry E. Studer, Davis, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Filed Jun. 25, 1979, Ser. No. 51,846
Int. Cl.³ A01D *45/00*
U.S. Cl. 56—327 R **37 Claims**



1. A method for mechanically harvesting a crop from a vine or like plant after the vines have been severed from their roots and lifted aboveground, comprising
shaking the vines by subjecting them to angular acceleration and deceleration while transporting said vines around an arcuate path about an horizontal axis and while holding said vines in said arcuate path,
collecting the crop shaken from the vines, and
disposing of the stripped vines.

4,232,507

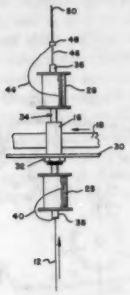
APPARATUS AND METHOD FOR WRAPPING CORE YARNS

Francis B. Northup, and Donald R. Hart, both of Sanford, N.C., assignors to Carlo Menegatto, Milan, Italy

Filed Feb. 22, 1973, Ser. No. 334,704
Int. Cl.² D02G *3/38*
U.S. Cl. 57—16 **15 Claims**

1. A method of wrapping a core yarn with a plurality of wrap yarns comprising directing a core yarn in a substantially vertical path of travel and into and through first and second rotating hollow spindles each rotatably carrying a spool of

wrap yarn on its opposite ends for wrapping the core yarn passing through the hollow spindles whereby the core yarn



will be successively wrapped by the wrap yarns carried by the hollow spindles.

4,232,508

KNOTTING MECHANISM PROVIDED WITH A DRIVING MECHANISM

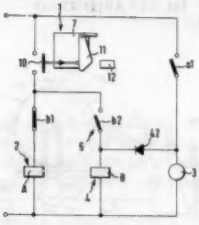
Gerd Husges, and Rupert Karl, both of Ingolstadt, Fed. Rep. of Germany, assignors to Schubert & Salzer, Ingolstadt, Fed. Rep. of Germany

Filed Jan. 22, 1979, Ser. No. 5,504

Claims priority, application Fed. Rep. of Germany, Jan. 24, 1978, 2802886

Int. Cl.³ D01H *15/02, 15/00*

U.S. Cl. 57—22 **11 Claims**



1. A knotting mechanism for use on an open end spinning machine for performing a knotting process on yarn being produced on said spinning machine, mounting means for supporting said knotting mechanism so as to permit said knotting mechanism to be moved along said spinning machine and transversely to said spinning machine to a knotting position, said knotting mechanism comprising:

a switching-on mechanism (1);

means for activating said switch-on (1) mechanism responsive to said knotting mechanism being moved transversely to said knotting position;

driving means (3) for initiating said knotting process on said yarn upon being activated;

a release means (2) operably connected to said driving means (3) for activating said driving means responsive to said switch-on mechanism (1) being activated;

timing means (4) for de-activating said driving means after a predetermined period of time sufficient to carry out said knotting process and for preventing said driving means from initiating another knotting process without first de-activating and re-activating said switch-on (1) mechanism.

4,232,509

METHOD AND DEVICE FOR JOINING AN UPPER THREAD TO A LOWER THREAD

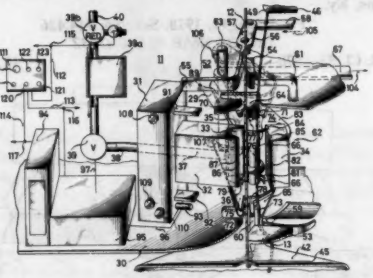
Joachim Rohner; Reinhard Mauries, and Heinz Zumfeld, all of Mönchengladbach, Fed. Rep. of Germany, assignors to W. Schlafhorst & Co., Mönchengladbach, Fed. Rep. of Germany

Filed Mar. 13, 1979, Ser. No. 20,099

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1978, 2810741; Apr. 13, 1978, 2815999; Oct. 10, 1978, 2845031; Nov. 27, 1978, 2851252

Int. Cl.³ D01H *15/00*

U.S. Cl. 57—261 **18 Claims**



1. Method for joining together an upper and a lower thread, which comprises moving at least one first thread feeder from a thread pick-up position to a thread transfer position, inserting the upper and the lower threads into a longitudinal slot formed in a chamber, holding the threads in the slot until compressed air is admitted to the chamber, and at given positions during the movement of the first thread feeder: closing the chamber with a lid, automatically severing the ends of the upper and lower thread and blowing compressed air into the chamber.

4,232,510

TIMEPIECE

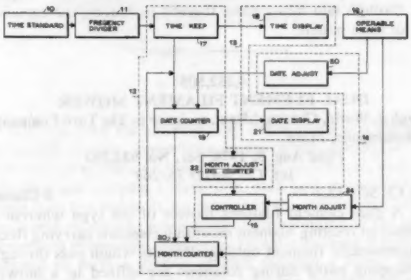
Munetaka Tamaru, Tokyo; Akira Tsuzuki, Ooizumigakuen; Shigeru Morokawa, Higashiyamato; Minoru Watanabe; Kazunari Kume, both of Tokorozawa, and Hideshi Oono, Sayama, all of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 616,053, Sep. 23, 1975, abandoned. This application Feb. 28, 1977, Ser. No. 772,934

Claims priority, application Japan, Sep. 25, 1974, 49-110202

Int. Cl.² G04B *19/24;* **G04C** *3/00;* **G04B** *27/00*

U.S. Cl. 368—28 **6 Claims**



1. A timepiece comprising:

time measuring means including an oscillator as a time base and a timekeeping means synchronized with said oscillator for keeping time information,

driving means, partially mechanical time display means rotated by said driving means for displaying at least part of the time information kept by said time keeping means when said time keeping means is in a time keeping mode, said time display means including an input data display part including at least an hour display, a minute display and a calendar display, said input data display part having a display which is changeable by a display changing, means to display a data to be delivered to the time measuring means when the time measuring means is in an input mode and to display the time information when the time measuring means is in the time keeping mode,

information means included in said time measuring means for providing additional time-related information,

inserting means for inserting the data into the information means, said inserting means including an actuating member for selectively actuating the time keeping mode and the input mode, a discriminating means for determining whether the timepiece is in the time keeping mode or input mode in accordance with the actuating member, and control means for controlling the transmission of the data to the information means, said controlling means transmitting during the input mode the data corresponding to the display of the input data display part, and

said timekeeping means keeping the time information independentaly of the display of the input data display part when said time measuring means is in the input mode and including a compensating means for providing the display of the input data display part with information corresponding to the time information of the time keeping means when the mode of said time measuring means is changed from the data input mode to the time keeping mode.

4,232,511

TIME DETECTING DEVICE FOR A CLOCK

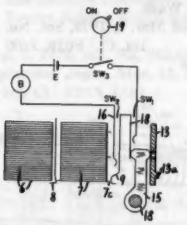
Kiyoshi Kitai, and Masuo Ogihara, both of Shikawatashi, Japan, assignors to Seiko Koki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 22, 1978, Ser. No. 935,763

Claims priority, application Japan, Aug. 29, 1977, 52/103314; Sep. 7, 1977, 52/107528

Int. Cl.[3] G04C *21/00*

U.S. Cl. 368—73 **6 Claims**



1. In a clock of the type which includes a rotating hour wheel having an angular position representative of the hour, a second rotating time wheel which rotates at a higher speed than the hour wheel and which has an angular position representative of a time interval less than one hour, time indicating leaves retained on said second time wheel and indicating time digitally, the improvement comprising a time signaling device for signaling when a predetermined time occurs, said time signaling device comprising: first detecting means for detecting when the hour wheel is at an angular position corresponding to the predetermined time; second detecting means for detecting when the second time wheel is at an angular position corresponding to the predetermined time and for thereafter successively detecting when predetermined time intervals occur during the hour following the detection of the predetermined time; said time indicating leaves having projections; and said second detecting means detecting one of said projections to determine the angular position of said second time wheel.

2. In a digital leaf clock having a plurality of hour leaves for indicating hours, and a plurality of minute leaves for indicating minutes, wherein ones of said minute leaves have projections for engaging and controlling exposure of the hour leaves as time advances, the improvement comprising: second projections on selected ones of said minute leaves spaced at regular intervals and independent of the first mentioned projections, and detecting means cooperative with said second projections for detecting at regular time intervals when the selected ones of said minute leaves are exposed for viewing.

4,232,512

SOLID STATE WATCH MODULE CONSTRUCTION

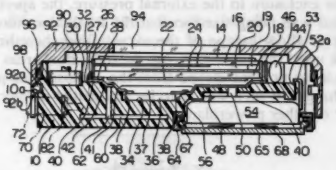
Kenichi Yoshikawa, Tokyo; Makoto Koshikawa, Higashimurayama; Toshio Umemoto, Koganei; Tetsuo Satoh, Higashiyamato; Singo Ichikawa, Sayama, and Yoshiaki Kato, Higashimurayama, all of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Dec. 22, 1977, Ser. No. 863,536

Claims priority, application Japan, Dec. 27, 1976, 51/157787; Dec. 27, 1976, 51/157795

Int. Cl.[2] G04C *3/00*; G04B *19/30, 37/00*

U.S. Cl. 368—82 **12 Claims**



1. A watch module construction comprising:

a single body of plastic material serving as a substrate and a baseplate, said single plastic body having formed on a first side thereof, a first cavity having a bottom and a second smaller cavity formed in the bottom of said first cavity with a stepped wall formed by said cavities on said first side of said single plastic body;

a plurality of printed circuit leads directly formed on said stepped wall by a printing technique, and an integrated circuit chip directly mounted in said second cavity on said first side of said single plastic body, said integrated circuit chip having electrical terminals connected to said printed circuit leads and adapted to provide drive signals; and

an electro-optical display means mounted in said first cavity in said first side of said single plastic body and having electrode patterns adapted to provide a display of characters on a viewing surface thereof, said display means having a plurality of electrical terminals connected to said electrode patterns, said electrical terminals of said display means being electrically connected to said printed circuit leads to provide an electrical connection therebetween whereby said display means receives said drive signals from said chip to provide a time indication by means of said electrode patterns;

said single plastic body having a cutout formed on the opposite second side thereof for receiving a battery, and serving as a back cover of a watch.

4,232,513

PRESSURE RELIEF PANEL FOR AIRCRAFT POWERPLANT

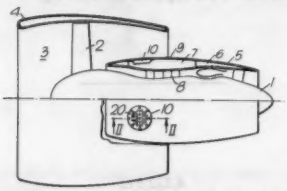
Kenneth A. Pearson, Henleaze, and Major D. Moorhouse, Stapleton, both of England, assignors to Rolls-Royce Limited, London, England

Filed Sep. 29, 1978, Ser. No. 947,153

Claims priority, application United Kingdom, Oct. 19, 1977, 43456/77

Int. Cl.³ F02G 3/00; F16K 17/14

U.S. Cl. 60—39.09 R **4 Claims**



1. A pressure relief panel for an aircraft powerplant comprising a frangible diaphragm within an enclosure defined by walls, the first one of the walls including an apertured area which is overlaid by the frangible diaphragm so that in operation the diaphragm is exposed to pressures on both sides of the wall but no flow passes through the wall, the diaphragm being adapted to break up when the pressure difference across the wall exceeds a predetermined minimum, a second one of the walls forming a cover over the diaphragm and adapted to form a smooth continuation of the powerplant outer surface, said second wall being apertured to allow exposure of the interior of the enclosure to the external pressure, the apertures in the second wall being sized so that the total area thereof is sufficient to allow escape of the excess fluid therethrough after break up of the diaphragm, but the individual areas thereof are such as to prevent escape from the enclosure of parts of the diaphragm of such size as to be a potential danger to the aircraft or other powerplants.

4,232,514

DUMP CONTROL FOR TURBINE ENGINE GATE VALVE ACTUATOR

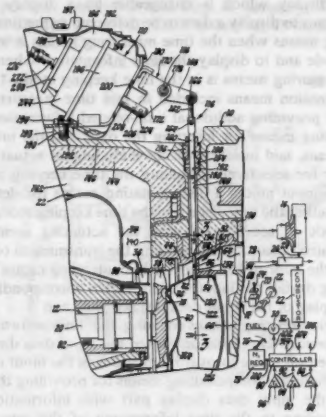
James H. Flatt, Anderson, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 20, 1979, Ser. No. 50,152

Int. Cl.³ F02C 9/02

U.S. Cl. 60—39.25 **3 Claims**

1. A gas turbine engine gate valve control system for positioning a partial admission gate into and out of an inlet flow path to a turbine nozzle downstream of a source of motive fluid including air flow from a compressor comprising: a pneumatic operator including a pressurizable power chamber therein and having a movable power diaphragm forming part of the pressurizable power chamber, a mounting base for the operator including an opening therein, an operator shaft connected at one end thereof to said power diaphragm and extending through said opening for reciprocal movement in response to movement of said diaphragm to position said partial admission gate, an end wall on said pneumatic operator having a dump opening therein, means including a control diaphragm forming a control chamber, said control chamber having a smaller diameter than said power diaphragm with a disc valve element thereon located in overlying relationship to said dump opening, said valve disc having a flow restriction orifice therein, means for directing a regulated source of pressure against said control diaphragm and through said orifice for pressure biasing said valve element against said end wall to close the dump opening therein during a first mode of gas turbine engine operation and to cause a controlled buildup of pressure within said pressurizable power chamber and a slow rate extension of said operator shaft to gradually shift said partial admission gate into the flow path to said power turbine nozzle, and means for terminating pressurization of said control diaphragm by said regulated source of pressure and to remove the biasing pressure acting on said control diaphragm, pressure on the opposite side of said control diaphragm continuously operative following termination of the regulated pressure source on said control diaphragm to cause a quick opening of said valve element, and means including said dump hole to dump pressurized fluid from said pressurizable power chamber and operative to cause a quick return movement of said shaft and the gate valve from a partial admission position to a fully open position thereby to prevent compressor surge.



4,232,515

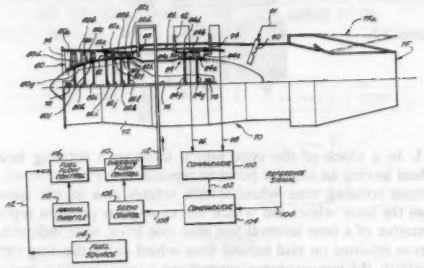
SUPERSONIC CRUISE AIRPLANE AND ENGINE

Robert B. Brown, Kent, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Mar. 6, 1978, Ser. No. 883,596

Int. Cl.² F02K 3/00

U.S. Cl. 60—204 **26 Claims**



1. In a turbine engine designed to provide a predetermined amount of thrust at a given throttle setting when propelling an airplane at a predetermined supersonic Mach number, the improvement comprising:

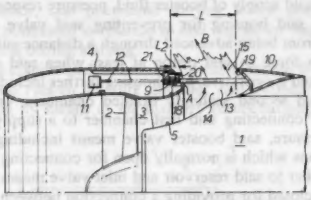
control means for maintaining the corrected airflow in said engine substantially at a constant value at flight Mach numbers below said predetermined supersonic Mach number.

4,232,516

FLOW DEFLECTING DEVICES

William J. Lewis, Winscombe; Leslie R. Harper, Bristol; Malcolm J. Davis, Bristol, and Richard G. Gardiner, Bristol, all of England, assignors to Rolls-Royce Limited, London, England

Filed Sep. 25, 1978, Ser. No. 945,505
Claims priority, application United Kingdom, Oct. 5, 1977, 41522/77
Int. Cl.[3] F02K 3/02
U.S. Cl. 60—226 A 3 Claims



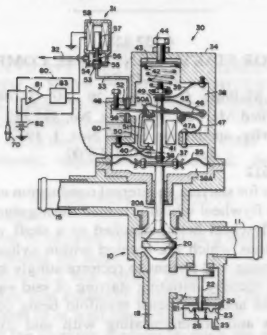
1. A translating cowl thrust reverser for a ducted fan gas turbine engine comprising radially inner and outer walls defining a fan duct, means for translating a portion of the radially outer wall axially to open up in the radially outer wall an aperture which has an inlet communicating with the fan duct and an outlet communicating with atmosphere, means for simultaneously blocking the fan duct as the aperture is opened and for directing flow from the fan duct into the inlet of the aperture, the aperture having upstream and downstream sidewalls which are shaped to give the flow through the aperture a forward component of velocity from the outlet thereof, and a substantially axially extending at least part-annular plate extending in a downstream direction from the upstream sidewall of the aperture only into a turbulent region of the flow and terminating upstream of the downstream extent of the upstream side-wall and defining with the upstream side-wall an annular recess open to the flow and in which, in operation, the flow causes a reduced pressure to delay the onset of separation from the upstream side-wall.

4,232,517

EXHAUST GAS CONTROL ACTUATOR

Masaharu Sumiyoshi, and Katsuhiko Motosugi, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Sep. 7, 1978, Ser. No. 940,445
Claims priority, application Japan, Mar. 13, 1978, 53-29096
Int. Cl.[3] F01N 3/10
U.S. Cl. 60—276 8 Claims



1. An exhaust gas control actuator wherein the feed of secondary air fed to an exhaust piping is controlled by a signal-emitting oxygen concentration detector disposed in the stream of exhaust gas of an internal combustion engine whereby an air-fuel ratio of the exhaust gas entering a catalyst disposed down-stream of the exhaust piping is maintained within a given range, said actuator comprising:

a flow control valve having a housing provided with a valve chamber, a flow-in port communicating said chamber with an air pump, a flow-out port communicating said chamber with an exhaust piping, a bypass port communicating said chamber with an air cleaner, and a movable valve body in said chamber controlling flow out of said flow-out port and said bypass port;

a flow control device for controlling said flow control valve comprising a housing partitioned by a diaphragm connected to said valve body into an actuating chamber and an atmospheric chamber, said actuating chamber having a vacuum introducing port communicating through a conduit with an intake manifold and an atmosphere introducing port constantly communicating with the atmosphere;

a solenoid valve in said conduit having ON-OFF positions;

an electronic circuit for controlling said solenoid valve in accordance with the signal from the detector;

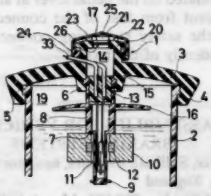
and a nozzle flapper mechanism in said actuating chamber for varying resistance to flow through said vacuum introducing port and said atmosphere introducing port in accordance with the position of said valve body in such a manner that the signal of the oxygen concentration detector is negatively fed back to control the feed of secondary air.

4,232,518

SEALED TYPE FLUID RESERVOIR

Mitsuyuki Suzuki, Okazaki, and Atsushi Ohmi, Anjo, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Nov. 21, 1978, Ser. No. 962,660
Claims priority, application Japan, Nov. 30, 1977, 52-143724
Int. Cl.[3] F15B 7/00
U.S. Cl. 60—535 2 Claims



1. A sealed type fluid reservoir mounted on a brake master cylinder comprising:

a casing which comprises transparent plastic material;

a main cap which comprises a rubber material disposed on the casing and which includes an upper portion extending therefrom having a comparatively thin portion, said thin portion of said upper portion of the cap including a slit formed therein;

a secondary cap mounted on the main cap;

a plurality of projections formed on the secondary cap;

air passage means formed between the secondary cap and said main cap by said projection;

groove means formed on said secondary cap for communicating said air passage means to atmospheric air, said casing including a brake fluid containing interior; and

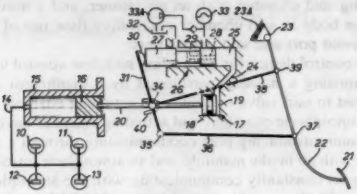
a chamber formed between said thin portion and said main cap in open communication with the casing interior, said slit of said thin portion comprising a radial slit such that said thin portion comprises a normally closed valve member for controlling flow of air from said air passage means to said casing interior and vice versa when differential pressure therebetween exceeds a set limit.

4,232,519

ASSISTED BRAKING DEVICE

Jean L. R. Dauvergne, Fosses, France, assignor to Societe Anonyme Francaise du Ferodo, Paris, France

Filed Nov. 21, 1978, Ser. No. 963,919
Claims priority, application France, Nov. 28, 1977, 77 35691
Int. Cl.³ B60T *13/20*
U.S. Cl. 60—550 **9 Claims**



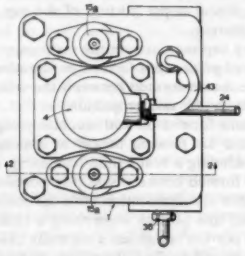
1. An assisted braking device comprising a master cylinder, a common body fixed to said member cylinder and incorporating a motor and a distributor, a master piston mounted slidably in said master cylinder, pilot means including a pedal mounted on a pivoted pedal lever, assisting means comprising said motor, one movable element of which is adapted to cooperate with the master piston via interconnecting means, an assistance energy source, said distributor being adapted to supply the motor with assistance energy from the said source, control means adapted to control the distributor in response to the actuation of the pilot means and comprising an arm and a connecting rod, the arm acting on a movable element of the distributor and being articulated on the said interconnecting means, the connecting rod connecting the pedal lever to the arm via two articulation points, and safety means which are actuated if the assisting means break down, so as to displace the master piston under the effect of the action exerted on the pedal, the safety means comprising a safety rod which is independent of the distributor control means, one end of the safety rod being articulated on the pedal lever at an articulation point which is different from that of the connecting rod, and the other end of the safety rod being connected to the master piston independently of the motor.

4,232,520

ACTUATOR ASSEMBLIES FOR VEHICLE HYDRAULIC BRAKING SYSTEMS

David A. Harries, Solihull, England, assignor to Girling Limited, Birmingham, England

Continuation of Ser. No. 793,891, May 4, 1977, abandoned. This application Feb. 16, 1979, Ser. No. 13,200
Claims priority, application United Kingdom, May 6, 1976, 18516/76
Int. Cl.³ B60T *13/20*
U.S. Cl. 60—550 **6 Claims**



1. A power-operated actuator assembly for a vehicle hydraulic braking system comprising a housing having a pressure space and a power chamber, a reservoir for fluid, an outlet port in said housing through which said pressure space can be connected to a wheel brake, a piston for controlling generation of pressure in said pressure space, means supplying booster fluid to said power chamber to operate said piston, booster valve means for controlling said supply of booster fluid to said power chamber, said booster valve means including a pedal-operated valve actuating member comprising means for applying an applying force manually to said piston in the event of a failure in said supply of booster fluid, pressure responsive stop means in said housing for preventing said valve actuating member from being advanced through a distance sufficient to transmit a force to said piston at least when said supply of booster fluid is operative, said housing further including a pair of first and second sealingly isolated chambers, connecting means for connecting said first chamber to a supply of fluid under pressure, said booster valve means including exhaust valve means which is normally open for connecting said second chamber to said reservoir and inlet valve means which is normally closed for providing a connection between said pair of chambers, said stop means including means closing said exhaust valve means to isolate said second chamber from said reservoir and means opening said inlet valve means to supply a metered proportion of fluid under pressure to said second chamber to oppose movement of said actuating member in said operating direction, wherein a member which is separate from said housing and movable in said housing divides said housing into two portions and includes means allowing communication between said portions on movement of said member to relieve any pressure which may be trapped in either of said pair of chambers upon failure of said supply of fluid under pressure, and said member comprises a stepped piston having a first portion of smaller area and a second portion of greater area, said housing having a stepped bore in which said stepped piston is located and said bore having an end wall through which said actuating member projects, a first bore portion of smaller area in which said first piston portion works and a second bore portion of greater area in which said second piston portion is movable with a clearance fit, said second piston portion normally having a sealing engagement with said end wall, said stepped piston having a blind axial bore in which said projecting part of said actuating member is in a working fit, said first chamber comprising a first compartment between said stepped piston and said second bore portion in permanent fluid communication with a second compartment defined between the inner end of said blind bore and said inlet valve means, and said second chamber comprising a third compartment defined in said blind bore between said inlet valve means and said exhaust valve means and in a permanent fluid communication with a fourth compartment defined between said stepped piston and a closed inner end of said stepped bore.

4,232,521

SYSTEM FOR STARTING INTERNAL COMBUSTION ENGINES

Salvador Gali Mallofre, C/Londres, 29 - 1º - 2ª, *Barcelona, Spain*

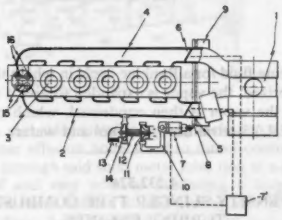
Filed Mar. 28, 1978, Ser. No. 891,117
Claims priority, application Spain, Nov. 1, 1977, 464.585
Int. Cl.³ F02B *37/00*
U.S. Cl. 60—612 **4 Claims**

1. A process for starting an internal combustion engine of the type having a flywheel which is turned during starting of said engine, said flywheel being attached to a shaft which is attached to pistons which are located within cylinders in said engine for causing said pistons to reciprocatingly move within said cylinders thereby initiating starting of said engine, an air intake manifold and an exhaust manifold being connected to said cylinders and communicating with said cylinders via intake and exhaust valves for respectively admitting a fuel-air mixture into said cylinders for combustion and for exhausting burned gases which result from combustion, and a turbocharger connected to and communicating with both said ex-

haust and intake manifolds whereby during normal operation of said engine said burned gases, which are exhausted through said exhaust manifold, drive said turbocharger, said turbocharger compressing said fuel-air mixture entering said cylinders by injecting air from the exterior said process comprising the steps of:

turning said engine flywheel by means of a pneumatic starting motor which has a toothed wheel for turning said engine flywheel during starting and an exhaust conduit for exhausting air which is used to drive said pneumatic starting motor, said pneumatic starting motor adapted for being positioned in relation to said engine for turning said flywheel during starting;

injecting compressed air into said intake manifold for enriching said fuel-air mixture entering said cylinders during starting by means of an auxiliary turbocharging unit in-



cluding a turbine and a compressor, said auxiliary turbocharging unit being connected to said exhaust conduit of said pneumatic starting motor, said stop of injecting comprising driving said turbine by said air being exhausted from said pneumatic starting motor through said exhaust conduit, thereby driving said compressor connected to said turbine, said compressor communicating with said exterior, drawing air from said exterior into said compressor and compressing said air, and passing the thus compressed air from said compressor into said intake manifold; and

closing off communication between said intake and exhaust manifolds and said turbocharger during starting by means of valves positioned at respective ends of said intake and exhaust adjacent said turbocharger, said valves located within said ends of said manifolds and being in a closed position.

4,232,522

METHOD AND APPARATUS FOR UTILIZING WASTE HEAT FROM A FLOWING HEAT VEHICLE MEDIUM

Anton Steiger, Illnau, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Jan. 19, 1979, Ser. No. 4,883

Claims priority, application Switzerland, Jan. 3, 1978, 2196/78

Int. Cl.³ F01K *23/08, 23/10*

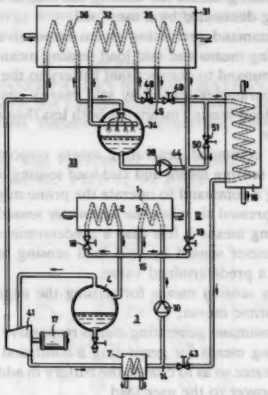
U.S. Cl. 60—618 **7 Claims**

1. A method of utilizing waste heat of a diesel engine, said method comprising the steps of

passing a flow of a heat vehicle medium utilized in a diesel engine into heat exchange relation with a flow of a working medium of at least one power circuit;

circulating the working medium through the power circuit to effect pre-heating, at least partial evaporation, expansion and condensation thereof;

introducing an additional quantity of a liquid working medium from a heating circuit into the power circuit prior to said pre-heating; and



discharging the liquid working medium from the power circuit after said pre-heating to at least one heat consuming means.

4,232,523

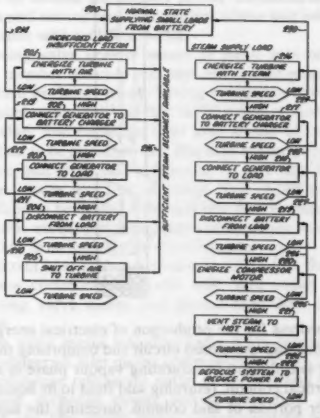
SOLAR POWER PLANT

Ronald C. Derby, 11162 Wickford Dr., Santa Ana, Calif. 92705; Stanley H. Zelinger, 14411 Heights Dr., Tustin, Calif. 92680; William P. Dampier, 525 Comanche Dr., Placentia, Calif. 92670, and Samuel P. Lazzara, 12002 Cherry St., Los Alamitos, Calif. 90720

Division of Ser. No. 710,569, Aug. 2, 1976, Pat. No. 4,079,591. This application Mar. 16, 1978, Ser. No. 887,064

Int. Cl.³ F03G *7/02*

U.S. Cl. 60—641 **4 Claims**



1. An Energy Management System for a solar power plant of the type which includes a solar collector for focusing the suns energy on a vaporizing converter, a prime mover operatively connected to operate from compressed air storage or thermally vaporized fluid, a hot well for storing excess solar energy, and a generator operatively connected to the output of the prime mover for driving a compressor and/or charging a storage battery, said energy management system coprising:

energy sensing means for sensing the rate at which energy is being outputted from said vaporizing converter;

load sensing means for sensing the rate at which energy is being demanded by a user load;

first command generating means responsive to said energy sensing means and said load sensing means for generating a command to connect said battery to the user load when the parameter sensed by said energy sensing means and said load sensing means are both less than a predetermined value;

second command generating means responsive to said energy sensing means and said load sensing means for generating a command to operate the prime mover from stored compressed air when the parameter sensed by said energy sensing means is less than a predetermined value and the parameter sensed by said load sensing means is greater than a predetermined value;

velocity sensing means for sensing the angular velocity of the prime mover;

third command generating means responsive to said velocity sensing means for generating a command to connect the generator so as to charge the battery in addition to supplying power to the user load.

4,232,524

PRODUCTION OF INDUSTRIAL ELECTRICAL ENERGY FROM HYDRAULIC ENERGY

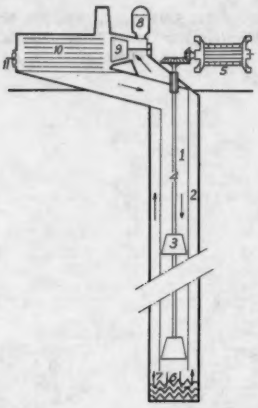
Eugene Goyat, Belley, France, assignor to Raymond Goyat, Cuzieu-Belley, France, a part interest

Filed Mar. 20, 1978, Ser. No. 888,031

Claims priority, application France, Mar. 24, 1977, 77 08757

Int. Cl.³ F01K *7/32*

U.S. Cl. 60—647 **6 Claims**



1. A process for the production of electrical energy from a fluid circulating in a closed circuit and comprising the steps of bringing said fluid to its saturating vapour phase in a substantially vertical column, returning said fluid to its liquid phase at the upper portion of said column, directing the liquid phase fluid downward through a fall column to return said fluid to the lower portion of said vertical column, vaporizing said fluid at said lower portion of said vertical column, and actuating at least one energy-producing member with said fluid in said fall column, said at least one energy-producing member being disposed in said fall column between said upper and lower portions, said process being characterized by maintaining the temperature in said vertical column such that the vapour phase of said fluid is close to its critical point.

4,232,525

WORKING FLUID FOR RANKINE CYCLE

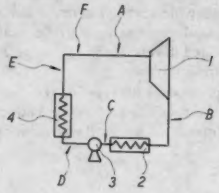
Naonori Enjo, Suita, and Hideki Aomi, Osaka, both of Japan, assignors to Daikin Kogyo Co. Ltd., Osaka, Japan

Filed Jan. 23, 1979, Ser. No. 5,801

Claims priority, application Japan, Feb. 7, 1978, 53-13123

Int. Cl.³ F01K *25/00*

U.S. Cl. 60—671 **3 Claims**



1. A working fluid for a Rankine cycle in which the working fluid is vaporized, the vapor is expanded to give a mechanical energy and the vapor is then condensed, which comprises a mixture of 2,2,3,3-tetrafluoropropanol and water.

4,232,526

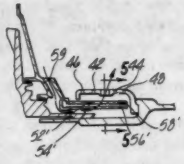
HIGH INTENSITY SLINGER TYPE COMBUSTOR FOR TURBINE ENGINES

Dennis E. Barbeau, Liberty Center, Ohio, assignor to Teledyne Industries, Inc., Los Angeles, Calif.

Filed Dec. 26, 1978, Ser. No. 972,678

Int. Cl.³ F02C *7/22*

U.S. Cl. 60—745 **6 Claims**



1. A turbine engine having a support housing, a shaft rotatably secured within said support housing, an air compressor rotatably mounted in said housing and having an inlet and an outlet, a combustor in said housing, said combustor having a chamber fluidly connected with the outlet of the compressor, means for supplying fuel to the combustor chamber, said last-mentioned means comprising a slinger type fuel injector secured to said shaft having an annular housing and a plurality of radial bores adapted to provide a plurality of axially spaced planes of fuel and air introduction into said combustor chamber, a stationary fuel manifold spaced radially inwardly from said injector housing and in fluid communication with a first portion of said radial bores, and air passage means for fluidly connecting the outlet of the compressor to a second portion of said radial bores.

4,232,527

COMBUSTOR LINER JOINTS

Samuel B. Reider, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

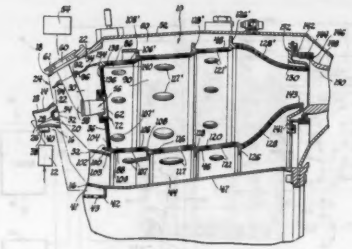
Continuation-in-part of Ser. No. 923,811, Jul. 12, 1978. This application Apr. 13, 1979, Ser. No. 29,781

Int. Cl.³ F02C *7/18*

U.S. Cl. 60—754 **5 Claims**

1. In a combustor for a gas turbine engine including a compressor discharging into a combustor diffuser directing dis-

charge flow from the compressor for uniform distribution to a dome plenum the improvement comprising: an annular porous liner wall segment, said liner wall segment defining a combustion zone downstream of said dome, said porous liner wall segment directing compressed air radially inwardly of the combustor at a point downstream of the dome plenum to cool the inner surfaces thereof by transpiration cooling, said wall segment having an inlet end thereon and an outlet end thereon, a solid metal joint ring welded to said inlet end to define a



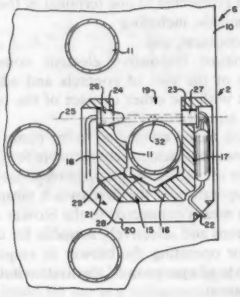
sealed joint, said solid metal joint ring including a plurality of small diameter effusion holes sized to direct cooling air from the plenum through said solid metal joint ring at a rate to cool the mass of said ring without producing a tangential wall stream on the inner surface of said porous liner wall segment thereby to direct heat from the sealed joint and said porous liner wall segment to maintain structural integrity therebetween without excessive diversion of total engine airflow from the plenum.

4,232,528

FROST DETECTOR

Joseph L. Behr, St. Louis County, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Mar. 16, 1978, Ser. No. 887,380
Int. Cl.[3] G08B *19/02;* **F25D** *21/02*
U.S. Cl. 62—140 **14 Claims**



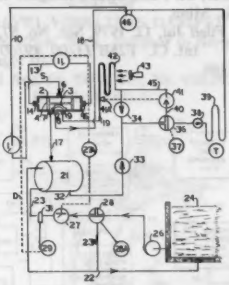
1. In a refrigeration system including a compressor having a high pressure outlet side, a low pressure inlet side, a first coil operatively connected to said compressor, a second coil operatively connected to said compressor and to said first coil, each of said coils including a tubular member having a predetermined length for carrying a refrigerant fluid, the improvement which comprises frost detector means directly mounted to said tubular member, said frost detector having a structure for mounting said detector to said tubular member, said structure including a channel for receiving the outer diameter of said tubular member, electromagnetic energy source means mounted to said structure and positioned to direct a beam of electromagnetic energy across the periphery of said tubular structure, an electromagnetic energy sensor mounted to said structure and separated from said source on a diametrically opposite side of said tube, and means for varying the beam path with respect to a tangent along the outer diameter of said tube between said energy source and said energy sensor.

4,232,529

ENERGY CONSERVATION REFRIGERATION UNIT

Frederick J. Babbitt, 564 Eastern Blvd., Clarksville, and Daniel K. Carnine, 1004 Hazelwood, Jeffersonville, both of Ind. 47130

Filed Aug. 1, 1978, Ser. No. 929,902
Int. Cl.[3] F25B *13/00, 27/02*
U.S. Cl. 62—160 **5 Claims**



1. A refrigeration system to selectively supply cooling to a space to be cooled and to heat a fluid including:

a. refrigerant compressor means having an expanded refrigerant inlet and a compressed refrigerant outlet;

b. reversing valve means including body means having an inlet communicating with said compressed refrigerant outlet and first, second and third outlet means and valve member means to selectively move from first position to permit communication between said first and second outlets where said valve inlet communicates with said third outlet to second position to permit communication between said second and third outlets where said inlet communicates with said first outlet;

c. reversing valve control means to move said reversing valve member between said first and second positions;

d. first heat exchange means having refrigerant inlet means communicating with said first outlet means of said reversing valve, first exchange fluid inlet means to introduce said fluid to be heated to said first heat exchange means to receive heat from said refrigerant in said first heat exchange means and first exchange fluid outlet means to emit fluid to be heated from said first heat exchanger and first heat exchanger refrigerant outlet means to emit refrigerant from said first heat exchanger;

e. refrigerant heat exchange means having a first fluid flow aperture communicating with said third outlet of said reversing valve means and second fluid flow aperture means;

f. bypass valve means inlcuding valve body means having first refrigerant inlet means communicating with said first heat exchange refrigerant outlet means and said refrigerant heat exchange means, second fluid flow aperture means and first outlet means communicating with said third reversing valve outlet and second outlet means connected to refrigerant evaporator means located in a space to be cooled and valve member means operable from a first position where said bypass valve inlet means communicates with said bypass conduit means to a second position wherein said bypass valve inlet means communicates with said second outlet means;

g. conduit means communicating with the outlet of said evaporator means and said inlet to said compressor means;

h. system control means including first temperature sensing means located in said first exchange fluid inlet means to activate said reversing valve means to said second position at preselected temperature and second temperature sensing means located in said space to be cooled and adpated to move said bypass valve member from said first position to said second position at preselected temperature in said space to be served

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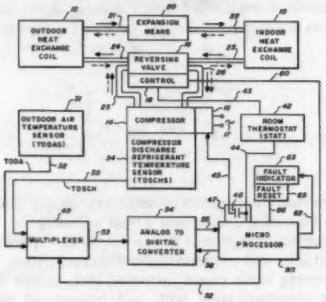
4,232,530

HEAT PUMP SYSTEM COMPRESSOR START FAULT DETECTOR

Dale A. Mueller, St. Paul, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jul. 12, 1979, Ser. No. 57,135
Int. Cl.[3] F25B *13/00, 49/00*
U.S. Cl. 62—160 **8 Claims**



1. A compressor start fault detection and control system (hereinafter "fault detection system") for a reverse cycle refrigeration system (hereinafter "system") for heating and cooling a building wherein said system comprises refrigerant compression means, refrigerant compression control means, an indoor coil, an outdoor coil, and refrigerant conduit means connecting said compression means and said coils, said fault detection system comprising:

compressor discharge temperature sensing means (hereinafter "TDSCHS") having an output indicative of the temperature (hereinafter "TDSCH") of the refrigerant discharged from said refrigerant discharge means; and

building temperature sensing means (hereinafter "STAT") having an output indicative of a demand for heating or cooling of the building; and

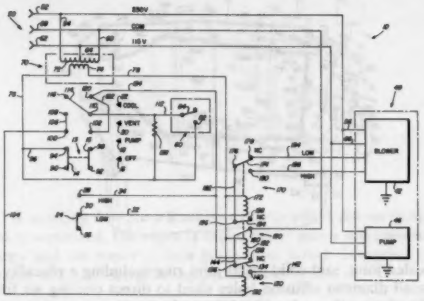
controller means having operative connections to said TDSCHS and STAT so as to receive the outputs thereof, said controller means including circuit connect-disconnect means selectively interconnecting said STAT output to said refrigerant compression control means whereby when said STAT output is connected thereto said compression means is enabled to operate and when said STAT output is disconnected therefrom said compression means is inhibited from operating, said controller means also including timing means and means for comparing the initial value of TDSCH (hereinafter "TD_1") measured at or near the start-up of the compressor and the value of TDSCH (hereinafter "TD_2.") after a predetermined time interval measured from the measurement of TD_1, and said controller means further being characterized by being adapted to inhibit said compression means from operating if, after a said preselected time interval as measured by said timing means, the value of TD_2 is less than the value of TD_1 plus said predetermined constant.

4,232,531

THERMOSTATIC CONTROL APPARATUS FOR EVAPORATIVE COOLING SYSTEM

William M. Mangam, Jr.; John J. Willis, Jr., and Myron Jones, Jr., all of Phoenix, Ariz., assignors to Dial Manufacturing, Inc., Phoenix, Ariz.

Filed Jun. 29, 1979, Ser. No. 53,243
Int. Cl.[3] F28D *3/00;* **F25D** *17/00*
U.S. Cl. 62—171 **9 Claims**



1. Control apparatus for controlling electrical current flow including signal voltage and line voltage in an evaporative cooling system having a blower and a pump operated by the line voltage, comprising, in combination:

first switch means selectively connected to the thermostat, to the blower, and to the pump, for selecting one of a plurality of modes of operation of the blower and pump, including

a first plurality of terminals,

a first switch element movable between some of the first plurality of terminals representing the modes of operation of the pump,

a second plurality of terminals, and

a second switch element movable with the first switch element between some of the second plurality of terminals representing the modes of operation of the blower;

a thermostat connected to one terminal of the second plurality of terminals, including

a pair of contacts, and

a temperature responsive element connected to one contact of the pair of contacts and adapted to make contact with the other contact of the pair of contacts upon a temperature rise;

second switch means connected to the pump and to the first switch means and selectively actuable for controlling line voltage for operating the pump in response to the selected mode of operation of the first switch means; and

third switch means connected to the blower and to the first switch means and selectively actuable for controlling line voltage for operating the blower in response to the selected mode of operation of the first switch means and of the thermostat.

4,232,532

APPARATUS FOR CONTROLLING THE TEMPERATURE OF A BOTTLE

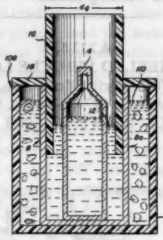
Lawrence B. Marsh, 12842 Littleton St., Silver Spring, Md. 20906

Filed Jun. 27, 1979, Ser. No. 52,468
Int. Cl.[3] F25D *3/08*
U.S. Cl. 62—457 **9 Claims**

1. Apparatus for controlling the temperature of a bottle or the like, comprising

(a) an outer container having a vertically arranged tubular wall portion open at its upper end, said tubular wall portion having an inner first diameter;

(b) an impermeable inner container having a vertically arranged tubular wall portion open at its upper end, the outer diameter of the inner container tubular wall portion being less than said first diameter, said inner container being formed of heat-conducting material and being arranged in concentrically spaced relation within said outer container, the inner diameter of said inner container tubular wall portion being greater than the outer diameter of the bottle;



(c) a first fluid medium arranged in the space between said inner and outer containers, said first fluid medium having a given initial temperature; and

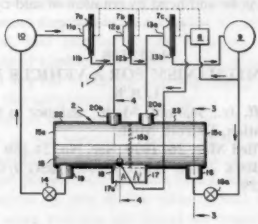
(d) heat energy transfer control means arranged within said inner container, whereby when the bottle is placed in said inner container, said control means controls the transfer of heat energy between the bottle and said first fluid medium through said inner container to control the temperature of the bottle.

4,232,533

MULTI-STAGE ECONOMIZER

James T. Lundblad, Onalaska, and Chester D. Ware, La Crosse, both of Wis., assignors to The Trane Company, La Crosse, Wis.

Filed Jun. 29, 1979, Ser. No. 53,578
Int. Cl.³ F25B *39/04*
U.S. Cl. 62—509 **15 Claims**



1. An economizer having a pluraity of stages for flash cooling refrigerant liquid for use in a refrigeration system comprising

a. housing means defining a plurality of chambers of successively lower pressure, a first chamber being at the highest pressure, and a last chamber at the lowest pressure;

b. first inlet means for conveying refrigerant liquid into said first chamber which is at the highest pressure;

c. first outlet means for conveying the cooled refrigerant liquid out of said last chamber which is at the lowest pressure;

d. second inlet means for conveying refrigerant into each of the chambers except said first chamber;

e. second outlet means for conveying cooled refrigerant predominantly in the liquid stage, out from each of the chambers except said last chamber;

f. connecting means for connecting the second outlet means of a chamber of relatively higher pressure together in fluid communication with the second inlet means of a chamber of successively lower pressure, said connecting means including sump means for collecting the cooled refrigerant liquid which flows through said connecting means;

g. throttling means for restricting the flow of refrigerant into each chamber and thereby reducing its pressure such that a portion of the refrigerant liquid flashes or evaporates as it flows through said throttling means, and thereby cools the liquid refrigerant remaining; and

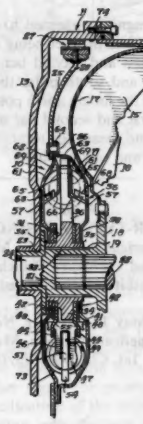
h. flash gas outlet means disposed near the top of each chamber, and operative to convey flash gas away from that chamber.

4,232,534

EXTENDED TRAVEL VIBRATION DAMPER ASSEMBLY

Paul E. Lamarche, Utica, Mich., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Aug. 14, 1978, Ser. No. 933,392
Int. Cl.³ F16D *3/14*
U.S. Cl. 64—27 C **22 Claims**



1. A vibration damper assembly to transmit torque between driving and driven members, comprising an input member adapted to engage torque input means, a hub operatively connected to torque output means and having a pair of diametrically opposed radial arms, a pair of equalizers journalled on and floating independently of said hub, each equalizer including a pair of equalizer plates located on opposite sides of said hub, each plate having a pair of oppositely disposed peripheral tabs, a wedge-shaped separator mounted between each pair of axially aligned tabs of a pair of equalizer plates, resilient means interposed between said hub arms and separators, and a pair of cover plates substantially enclosing said hub, equalizers and resilient means and operatively connected to said input member, each cover plate having integral drive means therein interposed in the path of said resilient means.

4,232,535

SELF-ALIGNING-AXIAL SHAFTS-MAGNETIC COUPLING

Walter C. Caldwell, Irving, Tex., assignor to Sun Oil Company (Delaware), Dallas, Tex.

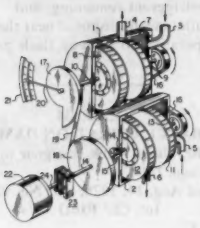
Filed Mar. 5, 1979, Ser. No. 17,505
Int. Cl.³ F16D *3/56, 7/00*
U.S. Cl. 64—28 M **2 Claims**

1. A mechanism for flexibly coupling first and second substantially axially aligned shafts comprising:

(A) a yoke structure connected to one end of the first shaft,

said yoke structure having inwardly facing first and second opposing surfaces disposed generally parallel to the axis of the first shaft;

(B) first and second bar magnets affixed, respectively, on said first and second facing surfaces with a space therebetween, said first and second bar magnets being oriented with like poles thereof facing one another across said space;



(C) a third bar magnet connected to one end of the second shaft, said third bar magnet being disposed in said space between said first and second bar magnets and oriented with the north and south poles thereof situated, respectively, between the facing north poles and the facing south poles of said first and second bar magnets; and

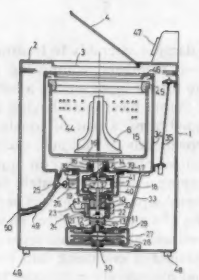
(D) first and second means for rotatably supporting, respectively, the first and second shafts.

4,232,536

AGITATOR-TYPE WASHING MACHINE

Wasuke Koseki, Moriguchi; Kunihito Mori, Toyonaka; Hideo Obata, Ibaraki, and Yoshikazu Shinchi, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed May 1, 1979, Ser. No. 35,268
Claims priority, application Japan, May 16, 1978, 53-058422
Int. Cl.[3] D06F *13/02*
U.S. Cl. 68—12 R **7 Claims**



1. An agitator-type washing machine comprising a washing tub,

a spin basket rotatably disposed in said washing tub,

a reciprocal agitator rotatably disposed in said spin basket,

a spin basket shaft rotatably journalled to said washing tub and on which said spin basket is mounted,

an agitator shaft rotatably journalled in and held coaxially to said spin basket shaft,

an axial-airgap motor having a motor shaft,

a reduction gear having an input shaft and an output shaft, said input shaft being connected to said motor shaft and said output shaft being connected to said spin basket shaft,

a clutch having an input shaft and an output shaft, said input shaft being connected to said motor shaft and said output shaft connected to said spin basket shaft,

motor control circuit means for changing motor operation between a washing mode, to drive said axial-airgap motor reciprocatingly, and a spinning mode to drive said axial-airgap motor continuously in one direction, and

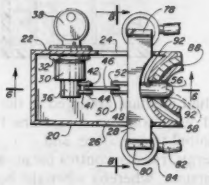
interlocking means for interlocking said motor control circuit means with said clutch in a manner that, when said clutch is disconnected, said motor control circuit means is changed to said washing mode.

4,232,537

WHEELED VEHICLE LOCK

Charles E. Plaiss, 7058 North Olcott Ave., Chicago, Ill. 60631

Filed Aug. 3, 1978, Ser. No. 930,719
Int. Cl.[3] B62H *5/00*; E05B *71/00*
U.S. Cl. 70—233 **2 Claims**



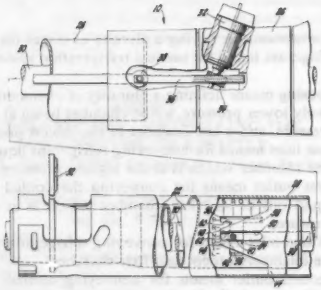
1. A wheel vehicle lock for permanent securement to the head of a wheeled vehicle having a fork stem seated therein and each having an aligned perforation, a closed hollow housing, having side, bottom and end walls, an aligned slot in each side wall, a perforation in one of said end walls, a keyed cylinder lock having a plug, said cylinder lock mounted on one of said side walls adjacent said slots, the cylinder and plug extending interiorally into said housing, a latch bolt, a transverse elongated bar anchored medially to said bolt positioned in and through said slots in said side walls and shiftable by said bolt, yokes on said plug and bolt extending towards each other, a link arm pivotally secured in and between said yokes whereby to shift said bolt horizontally into and out of said aligned perforations in said yoke and head by rotation of said cylinder lock.

4,232,538

CONTROL MECHANISM FOR A VEHICLE IGNITION LOCK

John C. Detloff, Jr., Saginaw, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 26, 1979, Ser. No. 24,169
Int. Cl.[3] B60K *20/00*; B60R *25/00*; G05G *9/00, 9/12*
U.S. Cl. 70—239 **2 Claims**



1. A position control mechanism for use in a vehicle having

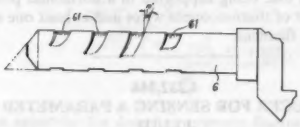
a steering column, a steering column mounted ignition lock mechanism movable by the operator to "Start", "Run", "Off" and "Lock" positions, and a floor mounted transmission control mechanism, said position control mechanism comprising; a tubular member concentric with the axis of the steering column and being rotatable about the axis by the transmission control mechanism; an opening in said tubular member having circumferentially extending axially spaced parallel control surfaces, axially aligned end slots extending axially from one end of said control surfaces, and another slot extending axially from only one of said control surfaces intermediate the ends of the one said control surface; and pin means operatively connected with the ignition lock mechanism and limited in axial movement by said opening, whereby said ignition lock mechanism is movable to all of its positions only when said pin means is axially aligned with said end slots, is movable to said "Start", "Run" and "Off" positions when said pin means is axially aligned with said another slot, and is freely movable between said control surfaces to said "Off" and "Run" positions regardless of the axial relationship of said opening relative to said pin means.

4,232,539

LOCK BODY WITH LOCK PLATES OPENED OR CLOSED BY A CYLINDRICAL KEY BAR

Jiuan P. Lo, 30-1, La. 325, St. Tong Ho, Taipei, Taiwan

Filed Feb. 8, 1978, Ser. No. 876,042
Int. Cl.[2] E05B *19/08, 29/06*
U.S. Cl. 70—364 R **9 Claims**



1. A cylindrical lock comprising:
a housing;
a cylindrical plug mounted for rotation in said housing;
a roll-back mounted for rotation with said plug;
tumbler means disposed in said plug for opening and closing said lock, said tumbler means including a plurality of plate-shaped tumblers disposed in said plug;
cylindrical key bar means for aligning said plurality of tumblers at the periphery of said plug;
said bar means including a cylindrical bar having angled grooves in the periphery thereof each of said tumblers corresponding to one of said plurality of grooves;
each of said plurality of tumblers being responsive to pressure applied by one of the sides of said corresponding groove when said key bar means are rotated in said plug, to rotate said plug and said roll-back.

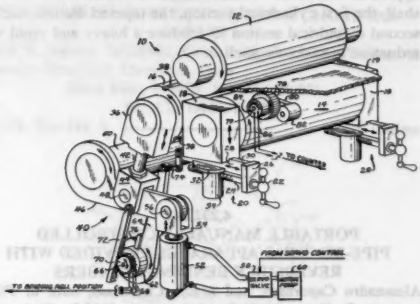
4,232,540

CONTROLLED VARIABLE RADIUS ROLL FORMING APPARATUS

Jack C. Cain, 536 S. Waterman Ave., Arlington Heights, Ill. 60004, and Maynard E. Carlson, Rte. 1, Carlson Rd., Box 289, West Salem, Wis. 54669

Filed Mar. 19, 1979, Ser. No. 21,798
Int. Cl.[3] B21D *5/14*; G01B *5/20*
U.S. Cl. 72—11 **16 Claims**

1. A roll forming apparatus for curling a sheet of metal into a curved configuration having a plurality of sheet contours each in a respective segment of said sheet, the apparatus including a pair of pinch rolls and a bending roll for curving the sheet into predetermined arcs dependent upon the relative positions of the bending and pinch rolls, and power means for varying the relative positions of the bending and pinch rolls, said apparatus being characterized by:
measuring means responsive to the movement of the sheet through the roll forming apparatus and to generate progressive signals indicative of the extent of that movement; and
control means connected to said measuring means and to said power means for determining from said progressive signals which segment of the sheet is in the appropriate position for bending between the pinch and bending rolls and for causing said power means to establish said relative positions of the pinch and bending rolls to produce the desired contour for that segment, said control means comprising



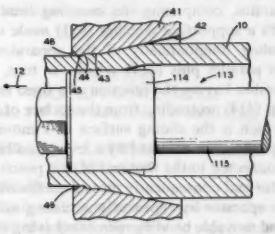
command value generator means to produce command value signals related to the distances of travel for the segments respectively,
comparator means connected to receive the signals from the measuring means and the command value generator means for comparing said signals and for producing a further signal when a distance corresponding to the end of the segment being rolled and the beginning of the next successive segment is reached, and
radius control and modification means connected to receive said further signal for producing a signal to the power means indicative of the relative positions of the pinch and bending rolls for said next successive segment.

4,232,541

DRAWING TECHNIQUE

Paul E. Stump, Beaver Falls, Pa., assignor to The Babcock & Wilcox Company, New Orleans, La.

Division of Ser. No. 879,288, Feb. 21, 1978, Pat. No. 4,148,207.
This application Jan. 23, 1979, Ser. No. 6,065
Int. Cl.[3] B21C *3/06*
U.S. Cl. 72—283 **2 Claims**



1. An improved method of cold drawing a tube shell to be worked through an apparatus having a die with generally constant diameter cylindrical mandrel plug means fixed within

the tube shell and within the die opening for improving outside smoothness of said tube shell which comprises: positioning the tube shell within a die opening having an approach zone, a die land including a first cylindrical section, a second smaller diameter cylindrical section, a tapered section connecting the first section to the second section, and a countersunk exit section, the second smaller diameter cylindrical section being adjacent to the exit section of the die opening; contacting the interior of the tube shell with the mandrel plug when said contacting surface is adjacent said approach zone to prevent reduction of the inside diameter of said tube shell; contacting the exterior of the tube shell with the surface of the die opening; and axially drawing the tube shell so that the exterior surface contacts in order at least part of the surface of the approach zone to first reduce the outside diameter of said tube shell, the first cylindrical section, the tapered section, and the second cylindrical section to produce a heavy and rapid wall reduction in said tube shell.

4,232,542

PORTABLE MANUALLY CONTROLLED PIPE-BENDING APPARATUS PROVIDED WITH REVERSIBLE BENDING MEMBERS

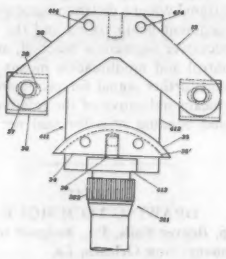
Alessandro Caporusso, and Mario Caporusso, both of Piedimonte S. Germano, Italy, assignors to C.M.L. Costruzioni Meccaniche Liri S.r.l., Piedimonte S. Germano, Italy

Filed Mar. 29, 1979, Ser. No. 25,453

Claims priority, application Italy, Apr. 6, 1978, 48765 A/78

Int. Cl.[3] B21D *7/06*

U.S. Cl. 72—389 **5 Claims**



1. A portable, manually controlled, hydraulic pipe-bending apparatus provided with a coupling head and reversible bending members to reverse the bending direction of a pipe relative to the apparatus, comprising the coupling head being (311) integral with a supporting member (411) made up of a plate (412) extending longitudinally of the apparatus, said plate having two parallel pins (414) which, in turn, support the bending member having the function of a fixed bending member, said pins (414) protruding from the surface of said supporting plate which is the sliding surface of a movable bending member, a piston stem actuated by a lever, said bending member being connected to the free end of said piston stem (30) of said apparatus and consequently moved therewith when operated by the operator by repeatedly actuating said lever (12), said fixed and movable bending members having the possibility of a reversible assembling on said pins (414) which are protruding from the plate (412) or on the end of said piston stem (30), respectively, in accordance with the desired bending direction of a pipe (T).

4,232,543

DEVICE FOR MEASURING THERMAL CONDUCTIVITY OF LIQUIDS

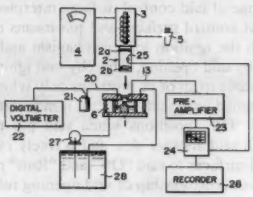
Wataru Eguchi, Kyoto; Makoto Harada, Otsu; Masataka Tanigaki, and Yutaka Tada, both of Kyoto, all of Japan, assignors to The President of Kyoto University, Kyoto, Japan

Filed Aug. 22, 1979, Ser. No. 68,525

Claims priority, application Japan, Feb. 28, 1979, 54-023050

Int. Cl.[3] G01N *25/18*

U.S. Cl. 73—15 A **7 Claims**



1. A device for measuring thermal conductivity of liquids, comprising:

a thin and small metal disc to be heated by a laser flash;

a sample holding block located beneath said metal disc; and

a pair of thermocouple wires connected to said metal disc to measure the thermal conductivity of a sample liquid on the basis of thermal diffusion from said metal disc to a cylindrical layer of said sample liquid inserted between said metal disc and said sample holding block;

said metal disc being supported in a horizontal position by said pair of thermocouple wires and at least one auxiliary support filament.

4,232,544

TRANSDUCER FOR SENSING A PARAMETER OF A FLUID

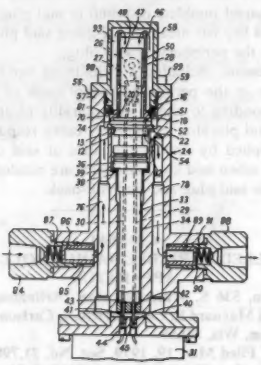
James W. Stansfeld, Beech, Near Alton, England, assignor to Solartron Electronic Group Limited, Farnborough, England

Filed Aug. 2, 1979, Ser. No. 63,300

Claims priority, application United Kingdom, Aug. 14, 1978, 33229/78

Int. Cl.[3] G01N *9/00*; G01L *9/00*

U.S. Cl. 73—32 A **10 Claims**



1. A transducer for measuring a characteristic of a fluid, comprising:

means forming a substantially rigid cylindrical base, said means having two annular shoulder surfaces;

a cylindrical hollow body of which a wall is relatively resilient and resonantly vibratable, said hollow body including a mounting mass structure with two annular clamping

surfaces, the first of the clamping surfaces being applied against the first shoulder surface; and

a cylindrical cover including an annular spring defined between two further annular surfaces, one of the two said further surfaces being applied against the second annular shoulder surface, and the other of the two further surfaces being applied against the second clamping surface.

4,232,545

APPARATUS FOR DETECTING PRESSURE FLUCTUATIONS IN THE COMBUSTION CHAMBER OF AN INTERNAL COMBUSTION ENGINE

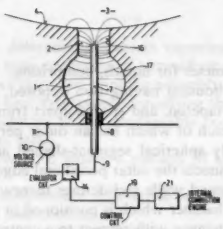
Klaus Dobler, Gerlingen; Christian Zrenner, Stuttgart; Günter Schirmer, Ingersheim, and Alfred Kizler, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jan. 10, 1979, Ser. No. 2,478

Claims priority, application Fed. Rep. of Germany, Jan. 19, 1978, 2802202

Int. Cl.³ G01M *15/00*

U.S. Cl. 73—35 **8 Claims**



1. In an apparatus for detecting pressure fluctuations in the combustion chamber of an internal combustion engine, comprising:

an ionic current sensor mounted to the engine for exposure to the gas in a combustion chamber, said ionic current sensor including: means defining a dead space and a connecting channel which extends between the dead space and the combustion chamber; a first electrode; and a second electrode spaced from the first electrode, between which electrodes a measurement voltage is applied, wherein said connecting channel also defines the spacing between the first and second electrodes.

4,232,546

METHOD AND APPARATUS FOR TUBE LEAKAGE TESTING

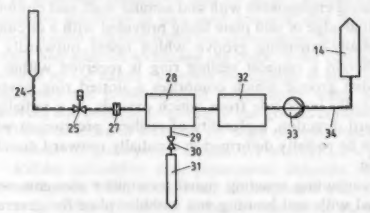
Willy Dumont, Nussbaumen, Switzerland, assignor to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Mar. 21, 1979, Ser. No. 22,633

Claims priority, application Sweden, Mar. 21, 1978, 3060/78

Int. Cl.³ G01M *3/20*

U.S. Cl. 73—40.7 **17 Claims**



1. An apparatus for measuring leakage, in a heat exchanger, especially in a moisture-separator, reheat superheater, wherein a heat transmission takes place between a first and a second flowing media separated from one another by a dividing wall, comprising:

first means for selectively supplying a test gas into the first flowing medium;

means for obtaining a sample of the second flowing medium;

means for removing non-gaseous components from the sample of the second flowing medium; and

means for detecting the test gas in the sample of the second flowing medium.

4,232,547

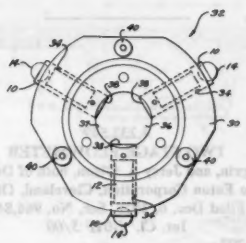
FORCE MEASURING DEVICE FOR A CHUCK OR COLLET

Daniel K. Kasper, Richfield, Ohio, assignor to The Warner & Swasey Company, Cleveland, Ohio

Filed Mar. 9, 1979, Ser. No. 19,051

Int. Cl.³ G01L *1/22*

U.S. Cl. 73—141 A **10 Claims**



6. A force transducer for measuring the force exerted by a gripping device having gripping elements such as the jaws of a chuck or segment of a collet comprising:

elongated shaped members each having at least two flat parallel surfaces formed intermediate its ends;

four strain gages associated with each of said elongated shaped members with two of the strain gages disposed on one of the two flat parallel surfaces and the other two strain gages disposed on the opposite flat surface;

a housing;

aligning means for aligning the elongated shaped members to extend radially outward from the housing into engagement with the gripping elements;

support means for engaging and solidly supporting the inner end of each elongated shaped member against radially inward movement;

instrumentation for monitoring the four strain gages; and

electric connecting means for connecting the four strain gages to said instrumentation.

4,232,548

LIQUID FLOW METER

Joseph Baumoel, 107 Columbia Dr., Jericho, Long Island, N.Y. 11753

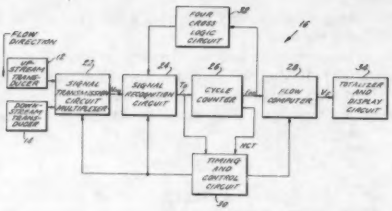
Filed Mar. 1, 1979, Ser. No. 16,525

Int. Cl.³ G01F *1/66*

U.S. Cl. 73—861.28 **13 Claims**

13. Apparatus including means responsive to the receipt of a repetitive sinusoidal pulse signal; said apparatus including means for measuring the arrival time of repetitive sinusoidal waveform pulses which are accompanied by noise, means for detecting the zero cross-over point of each of a plurality of loops in said sinusoidal waveform pulse, means averaging the time of arrival of each of the corresponding zero cross-over

points in each repetitively received signal, and means connecting a signal related to the averaged time of arrival of at least a



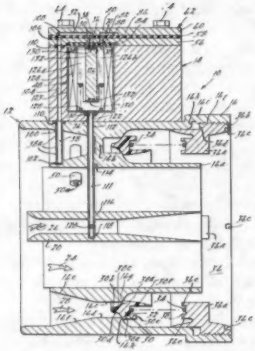
selected one of said zero cross-over points to said means responsive to said signal.

4,232,549

TWO STAGE FLOWMETER

Robert S. Migrin, and Jerry A. Olson, both of Dearborn, Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Dec. 6, 1978, Ser. No. 966,844
Int. Cl.³ G01F 5/00
U.S. Cl. 73—202 **18 Claims**



1. A fluid flowmeter comprising: a main passage for the flow of fluid therethrough;

swirl means disposed within said main passage and operative to form a low static pressure region immediately downstream thereof;

a secondary passage disposed within said main passage for communicating a portion of the fluid upstream of said swirl means to a point downstream of said swirl means adjacent said low static pressure region;

means for sensing the pressure of the fluid in said low static pressure region and the pressure of the fluid before said swirl means; and

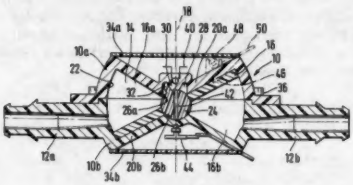
a bypass passage operative to selectively interconnect a point upstream of said swirl means with a second point downstream of said swirl means radially outwardly adjacent the low pressure region.

4,232,550

FLOWMETER FOR LIQUIDS

Georg Aigner, Leonberg, Fed. Rep. of Germany, assignor to KDM Elecktronik GmbH, Nuremberg, Fed. Rep. of Germany

Filed Jan. 2, 1979, Ser. No. 416
Claims priority, application Fed. Rep. of Germany, Dec. 31, 1977, 2759176
Int. Cl.³ G01F 3/12
U.S. Cl. 73—258 **4 Claims**



1. A flowmeter for liquids, comprising:

a hollow housing having two opposed, axially-aligned, inwardly-tapered, and spaced-apart truncated cone-shaped walls, each of which has an outer peripheral edge and a generally spherical segment-shaped annular wall which interconnects the outer peripheral edges of said truncated cone-shaped walls and defines therewith an internal metering chamber which is positioned in a rotationally symmetric manner with respect to a central axis coaxial with the axes of said cone-shaped walls and which is symmetrically configured with respect to a plane passing through said central axis, said truncated, cone-shaped walls each having a centrally-shaped coaxially-aligned ball socket formed therein, one of which has an annular groove formed therein;

at least two liquid connections coupled to said housing and communicating with said metering chamber for establishsing a liquid flow therethrough;

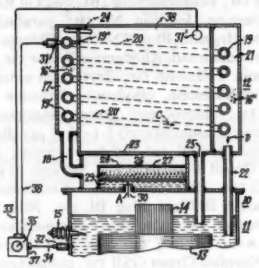
a generally disc-shaped wobble plate having a centrally-disposed spherical wobble center mounted within said metering chamber with said spherical wobble center thereof rotatably retained between said ball sockets, said wobble plate dividing said chamber into two subchambers, defined by a plane extending through said central axis, said spherical center having a radially outwardly extending shoulder which is disposed generally normally relative to said wobble plate and which is slidably received within said annular groove formed in one of said ball sockets, said shoulder being disposed at an angle to said central axis which complements the conical angle of said cone-shaped walls to form a combined angle of about 180°, said wobble plate having a circumferential edge which is in resilient sealing engagement with said annular wall, said circumferential edge of said plate being provided with a circumferentially-extending groove which opens outwardly and wherein a resilient sealing ring is received within said radial groove which comprises a slotted ring having a radially inner side from which extends, in a radially inward direction, a plurality of resilient protrusions which can be radially deformed in a radially outward direction; and

non-contacting coacting signal transmitter elements associated with said housing and wobbler plate for generating signals proportionally corresponding to the wobble frequency of said wobble plate.

4,232,551
LEAK DETECTOR FOR VAPORIZATION COOLED TRANSFORMERS

Linden W. Pierce, Rome, Ga., assignor to General Electric Company, N.Y.

Filed Mar. 19, 1979, Ser. No. 21,543
Int. Cl.³ G01M *3/32;* **G01K** *1/08;* **H01F** *27/10*
U.S. Cl. 73—350 **23 Claims**



1. A method for determining leaks in vaporization cooled transformers of the type consisting of a transformer tank containing a transformer core and winding assembly, a condensable coolant, and a heat exchanger, comprising the steps of:

sensing the temperature of the condensable coolant within said transformer tank;

sensing the temperature within a portion of said heat exchanger;

determining the temperature differential between said heat exchanger and said coolant; and

providing an indication when a predetermined temperature differential is exceeded, said excess temperature differential thereby indicating the presence of ambient air within said transformer.

4,232,552
TEMPERATURE INDICATING COMPOSITIONS OF MATTER

Craig R. Hof, Hopatcong, and Roy A. Ulin, Wyckoff, both of N.J., assignors to Akzona Incorporated, Asheville, N.C.

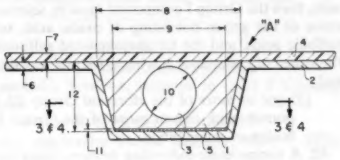
Continuation-in-part of Ser. No. 895,422, Apr. 13, 1978, abandoned, which is a continuation-in-part of Ser. No. 844,334, Oct. 21, 1977, abandoned, which is a continuation-in-part of Ser. No. 796,492, May 12, 1977, abandoned. This application Sep. 28, 1978, Ser. No. 946,935
Int. Cl.³ G01K *11/06, 11/08, 11/12, 11/16;* **C09K** *3/00*
U.S. Cl. 73—356 **89 Claims**

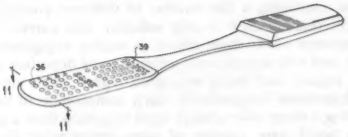
1. A composition of matter exhibiting a sharp color change upon transition from a liquid state to a solid state of from a solid state to a liquid state capable of being supercooled for at least several minutes, and substantially free of impurities, consisting essentially of:

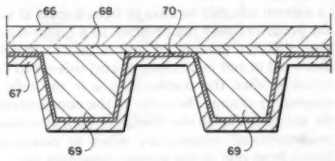
(a) a solvent adapted to change from a solid state at substantially a predetermined temperature to a liquid state; and

(b) an effective amount of one or more suitable organic moieties dissolved in and inert towards said solvent to form a solid solution when the composition is in the solid state, and adapted to change the color of the composition visible to the naked eye upon the change in state at substantially the predetermined temperature when so dissolved, and selected from one of the groups consisting of:

(1) one or more of a Group III body of compounds consisting of pinacyanol iodide, 1,1'-diethyl-2,2'-cyanine iodide, quinaldine red, pinacyanol chloride, thionin, methylene blue, cresol red, chlorophenol red, neutral red iodide, neutral red chloride, crystal violet, acridin orange, Orasol Orange RLN TM, Orasol Navy Blue TM, Irgalith Red PR TM, Fat Red BS TM, Xylene Cyanol FF TM, Rhodamine B TM, Rhodamine 6G TM, Irgalith Magneta TCB TM, Irgalith Pink TYNC TM, Toluidine Blue O TM, Savinyl Green B TM, Savinyl Blue RS TM, purpurin, 3,3'-diethylthiadicarbocyanine iodide, cryptocyanine, Dicyanine A TM, Merocyanine 540 TM, 4-(p-ethoxyphenylazo)-m-phenylene diamine monohydrochloride, Yellow Orange S TM, Chrysoidan G TM, fuchsin, aurintricarboxylic acid (ammonium salt), Victoria Blue R TM, Pyronin G TM, gallein, Erythrosin Yellow Blend TM, chlorophenol blue, bromophenol blue, bromocresol purple, Coriphosphine O TM, acriflavine, acridine orange, rhoduline violet, Alizarin cyanin 2R TM, Alizarin Red S TM, alcannin, Aurantia, Direct Green G TM, Fast Red Salt 3GL TM, Fast Blue Salt BB TM, Fast Garnet Salt GBC TM, Carta Yellow G 180 o/o TM, Murexide, Savinyl Blue GLS TM, Irgalith Blue GLSM TM, phthalocyanine, Di Amingreen B TM, Alizarin Blue S, Celliton Blue Extra TM, neocyanine, Janus Green TM, dimethyl yellow, Fast Yellow TM, methyl red sodium salt, Alizarin Yellow R TM, Eriochrome Black T TM, Chromotrope 2R TM, Ponceau 6R TM, Brilliant Ponceau G/R/2R TM, chromolan yellow, Sudan Red B TM, Bismarck brown G TM, Fat Black TM, Resorcin Brown TM, Benzofast Pink 2BL TM, Oil Red EGN TM, Euroglaucine, Fuchsin NB TM, parafuchsin, Patent Blue TM, Irgalith Blue TNC TM, Phloxin B TM, fluorescein sodium salt, Rhodamine B base TM, Eosin Scarlet, Eosin Yellowish TM, Erythrosin extra bluish, 4,5-dibromofluorescein, ethyleosin, Phloxine TM, Cyanovin B TM, chlorocresol green, pinacyanol bromide, 2-(p-dimethylaminostyryl)-1-ethyl pyridinium iodide, ethyl red, nigrosine, Savinyl Blue B TM, Orasol Blue BLN TM, Safranin O TM, Azocarnum G TM, Phenosafranine TM, Azocarmine BX TM, Solophenyl Brilliant Blue BL TM, Nile Blue A TM, gallocyanine, gallamine blue, celestine blue, methylene green, Azure A/B/C TM, Blue VIF Organol TM, Alizarin, Nitrofast Green GSB TM, quinalizarine, Oil Blue N TM, Solvay purple, Ciba Blue TM, Indigo synthetic TM, Chromophtal Bordeaux RS TM, Acid Alizarin Red B TM, 5-







aminoflourescein, Rose Bengal TM, Martius Yellow TM, Chicago Blue 6B TM, Alcian Blue 8GX TM, cresyl violet, 4,4'Bis(dimethylamino)benzylhdrol, zinc Pthalocyanine, Sudan III TM, Pyronin Y TM, Toluylene Blue TM, cresyl violet perchlorate, Mendola's Blue TM, Phosphine Dye, Nitron TM, cresyl violet acetate, Ceres Orange R TM, 4-phenylazo-1-naphtylamine, 4-(4-Dimethylamino-1-napthylazo)-3-methoxybenzene sulfonic acid, Bindschedler's Green TM, and p-(p-dimethylaminophenylazo)benzoic acid;

(2) a binary mixture of:

(A) one or more of a Group I body of compounds soluble in said solvent consisting of the halogenated sulfonphthaleins and the organic acids having a pK_1 less than about four; and

(B) one or more of a Group II body of compounds consisting of the aminotriphenylmethanes and their soluble salts, 8-hydroxyquinoline, and the cyanines;

wherein the weight ratio of the Group I body of compounds to the Group II body of compounds is more than or about 3 to 1 and with the proviso that if the Group II compounds consist solely of one or more aminotriphenylmethanes or their soluble salts, then the Group I compound must be selected from one or more of the group consisting of oxalic acid, suitable soluble sulfonic acids, and the tetrahalogenated sulfonphthaleins, and the other organic acids having a pK_1 of less than or about 2; and

(3) one or more of the aforesaid Group III body of compounds with one or more of the Group I or Group II bodies of compounds.

42. A temperature-indicating device comprising a heat conducting carrier having one or more spaced regions defined therein to determine a like number of predetermined temperatures in a predetermined temperature range, said spaced regions containing a like number of different compositions of matter therein, each a solid solution, said carrier having a transparent cover sheet means in sealing engagement therewith, and with a single solid solution being deposited in each of said regions and being associated with a single one of said predetermined temperatures, each composition of matter exhibiting a sharp color change upon transition from a solid state to a liquid state, capable of being supercooled for at least several minutes, and substantially free of impurities, consisting essentially of:

(a) a solvent adapted to change from a solid at substantially the predetermined temperature to a liquid state; and

(b) an effective amount of one or more suitable moieties dissolved in and inert towards said solvent to form a solid solution when the composition is in the solid state, and adapted to change the color of the composition visible to the naked eye upon the change in state at substantially the predetermined temperature when so dissolved, and selected from one of the groups consisting of:

(1) one or more of a Group III body of compounds consisting of pinacyanol iodide, quinaldine red, 1,1'-diethyl-2,2'-cyanine iodide, pinacyanol chloride, thionin, methylene blue, cresol red, chlorophenol red, neutral red iodide, neutral red chloride, crystal violet, acridin orange, Toluidin Blue O TM, Orasol Orange RLN TM, Orasol Navy Blue TM, Irgalith Red PR TM, Fat Red BS TM, Xylene Cyanol FF TM, Rhodamine 6G TM, Rhodanine B TM, Irgalith Magenta TCB TM, Irgalite pink TYNC TM, Toluidine Blue O, Savinyl Green B TM, Savinyl Blue RS TM, purpurin, 3,3'-diethylthiadicarbocyanine iodide, cryptocyanine, Dicyanine A TM, Merocyanine 540 TM, 4-(p-ethoxyphenylazo)-m-phenylene diamine monohydrochloride, Yellow Orange S TM, Chrysoidin G TM, fuchsin, aurintricarboxylic acid (ammonium salt), Victoria Blue R TM, Pyronin G TM, gallein, Erythrosin Yellow Blend TM, chlorophenol blue, bromophenol blue, bromocresol purple, Coriphosphine O TM, acriflavine, acridine orange, rhoduline violet, Alizarin Cyanin 2R TM, Alizarin Red S TM, alcannin, Aurantia, Direct Green G TM, Fast Red Salt 3GL TM, Fast Blue Salt BB TM, Fast Garnet Salt GBC TM, Carta Yellow G 180 o/o TM, murexide, Savinyl Blue GLS TM, Irgalith Blue GLSM TM, phthalocyanine, Di Amingreen B TM, Alizarin Blue S, Celliton Blue Extra TM, neocyanine, Janus Green, dimethyl yellow, Fast Yellow, Methyl red sodium salt, Alizarin yellow R TM, Eriochrome Black T TM, Chromotrope 2R TM, Ponceau 6R TM, Brilliant Ponceau G/R/2R TM, chromolan yellow, Sudan Red B TM, Bismarck brown G TM, Fat Black TM, Resorcin Brown TM, Benzofast pink 2BL TM, Oil Red EGN TM, Euroglaucine, Fuchsin NB TM, parafuchsin, Patent Blue TM, Irgalith Blue TNC TM, Phloxin B TM, fluorescein sodium salt, Rhodamine B base TM, Eosin Scarlet, Esoin Yellowish TM, Erythrosin extra bluish 4,5-dibromofluorescein, ethyleosin, Phloxine TM, Cyanovin B TM, chlorocresol green, pinacyanol bromide, 2-(p-dimethylaminostyryl)-1-1-ethyl pryidinium iodide, ethyl red, neutral red iodide, nigrosine, savinyl blue B TM, Orasol Blue BLN TM, Safranin O TM, Azocarnun G TM, Phenosafranine, Azocarmine BX TM, Solophenyl Brilliant Blue BL TM, Nile Blue A TM, gallocyanine, gallamine blue, celestine blue, methylene green, Azure A/B/C TM, Blue VIF Organol TM, Alizarin, Nitrofast Green GSB TM, quinalizarine, Oil Blue N TM, Solvay purple, Ciba Blue TM, Indigo synthetic TM, Chromophtal Bordeaux RS TM, Acid Alizarin Red B TM, 5-Aminoflourescein, Rose Bengal TM, Martius Yellow TM, Chicago Blue 6B TM, Alcian Blue 8GX TM, Cresyl violet, 4,4'Bis(dimethylamino)benzylhdrol, Zinc Pthalocyanine, Sudan III TM, Pyronin Y TM, Toluylene Blue TM, cresyl violet perchlorate, Mendola's Blue TM, Phosphine Dye, Nitron TM, cresyl violet acetate, Ceres Orange R TM, 4-phenylazo-1-naphtyl-amine, 4-(4-Dimethylamino-1-napthylazo)-3-methoxybenzene sulfonic acid, Bindschedler's Green TM, p-(p-dimethylaminophenylazo) benzoic acid;

(2) a binary mixture of:

(A) one or more of a Group I body of compounds soluble in said solvent consisting of the halogenated sulfonphthaleins and the organic acids having a pK_1 of less than or about four; and

(B) one or more of a Group II body of compounds consisting of the aminotriphenylmethane and their soluble salts, 8-hydroxyquinoline, and the cyanines;

with the proviso that if the Group II compounds consist solely of one or more aminotriphenylmethanes or their soluble salts, then the Group I compound must be selected from one or more of the group consisting of oxalic acid, suitable soluble sulfonic acids and the tetrahalogenated sulfonphthaleins, and the other soluble organic acids having a pK_1 of less than or about 2, and wherein the weight ratio of the Group I body of compounds to the Group II body of compounds is more than or about 3 to 1; and

(3) one or more of the aforesaid Group III body of compounds with one or more of the Group I or Group II bodies of compounds.

4,232,553

ANGULAR ACCELERATION SENSING APPARATUS

Kenneth R. Benedetto, Medway, and Larry J. Linder, Dayton, both of Ohio, assignors to KBG Corporation, Medway, Ohio

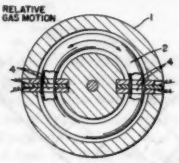
Filed Jan. 12, 1979, Ser. No. 3,489

Int. Cl.[3] **G01P** *15/08*

U.S. Cl. 73—516 LM **10 Claims**

1. An angular acceleration sensing apparatus free of any moving mechanical parts, mechanical linkages, servo mechanisms and the like and operative on a principle whereby relative motion of a volume of fluid contained within a hollow torroid is sensed when a container securable to an object under study is subjected to an angular acceleration about an axis perpendicular to a plane of the torroid, comprising: an enclosed circular fluid-filled channel in the form of a torroid

rigidly mounted in the container, pairs of thermally sensitive resistive elements suspended within said channel in fixed position, means for maintaining said elements at a constant temperature including an electrical circuit which forces said elements



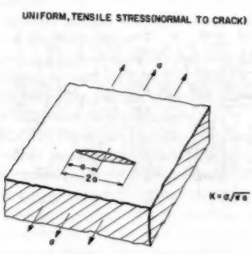
to operate at a preselected resistance corresponding to desired operating temperatue, and means electrically connected with respect to said circuit and said elements to yield signals respresentative of angular acceleration.

4,232,554

THERMAL EMISSION FLAW DETECTION METHOD

Benjamin J. Aleck, Jackson Heights, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Nov. 30, 1978, Ser. No. 964,912
Int. Cl.³ G01N *3/32*
U.S. Cl. 73—577 **9 Claims**



1. A nondestructive method for detecting flaws in a structure comprising a material having a characteristic threshold stress intensity factor, including the steps of:

(a) loading the structure at a level corresponding to a stress intensity factor below the characteristic threshold stress intensity factor of the material; and

(b) positioning detection means in thermal proximity to the structure for detecting thermal emission signals indicative of plastic deformation.

4,232,555

ULTRASONOGRAPHIC EXPOSURE APPARATUS

Robert B. Rosenfeld, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

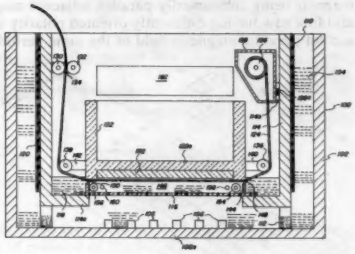
Filed Apr. 18, 1979, Ser. No. 30,972
Int. Cl.³ G01N *29/00*
U.S. Cl. 73—606 **20 Claims**

1. An ultrasonographic exposure apparatus comprising

a reservoir for an ultrasonic transport liquid,

an ultrasound transducer positioned to be immersed in the transport liquid,

means for supporting an ultrasonographic element within the transport liquid, and



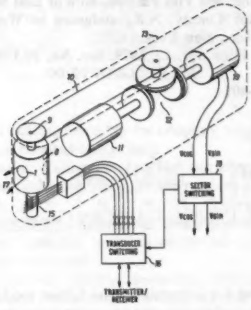
a damper located adjacent the ultrasonographic element remote from the ultrasound transducer to form an interface with the transport liquid within said reservoir.

4,232,556

MOVING TRANSDUCER SYSTEMS

Allan Cole, Lasswade, Scotland, assignor to E M I Limited, Hayes, England

Filed Mar. 1, 1979, Ser. No. 16,496
Claims priority, application United Kingdom, Mar. 7, 1978, 8915/78
Int. Cl.³ G01N *29/04*
U.S. Cl. 73—626 **20 Claims**



1. An arrangement for operating on sine and cosine components of a rotating vector signal, representing at different times the positions of different ones of two or more investigative transducers, rotating about an axis with constant relative phase, for control of a display on which the transducer outputs are displayed in alternation, the arrangement including means for varying the relative phase of the vector signal when representing at least one of said transducers to the vector signal when representing a first transducer, to correct display errors resulting from misalignment of said at least one transducer relative to said first transducer.

4,232,557

PERIODIC MAGNET UNIDIRECTIONAL TRANSDUCER

Carmine F. Vasile, Thousand Oaks, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

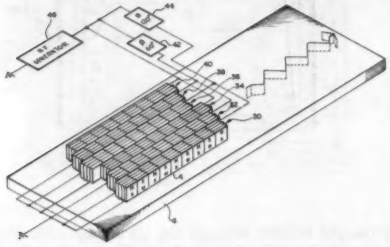
Filed Apr. 23, 1979, Ser. No. 32,057
Int. Cl.³ G01N *29/04*
U.S. Cl. 73—629 **10 Claims**

1. A periodic magnet, unidirectional transducer comprising:

a first row of permanent magnets, the N-S axes of said magnets being substantially parallel, adjacent magnets in said

first row having differently oriented polarity so that a first periodic magnetic field is created;

a second row of permanent magnets, the N-S axes of said magnets being substantially parallel, adjacent magnets in said first row having differently oriented polarity so that a second periodic magnetic field of the same periodicity as



said first field is created, said second row being positioned adjacent and parallel to said first row and being offset along its length by one-quarter period from said second row; and

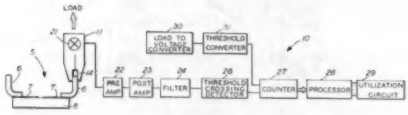
separate coils around said first and said second rows of magnets.

4,232,558

METHODS FOR DETERMINING BOND FAILURE MODES USING STRESS WAVE EMISSION TECHNIQUES

Min-Chung Jon, and Vito Palazzo, both of East Windsor Township, Mercer County, N.J., assignors to Western Electric Company, Inc., New York, N.Y.

Filed Apr. 12, 1979, Ser. No. 29,174
Int. Cl.³ G01N *29/00*
U.S. Cl. 73—801 **8 Claims**



1. A method for determining the failure mode of a bonded article during destructive testing, comprising the steps of:

monitoring the stress wave emissions emanating from the bonded article during the destructive test;

developing a signal that is proportional to the number of excursions of the stress wave emissions above a predetermined threshold; and

comparing the developed signal to empirically determined ranges of signals associated with known failure modes to determine the bond failure mode.

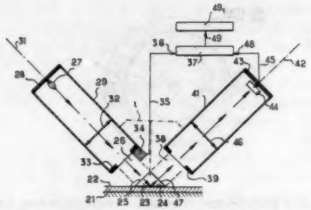
4,232,559

METHOD AND AN APPARATUS FOR MEASURING THE BONDING POWER OF AN ADHESIVE MATERIAL

Jean-Paul Favre, Bourg la Reine; Joseph Perrin, Clamart; Michel Philbert, Paris, and Jean Surget, Joinville le Pont, all of France, assignors to Office National d'Etudes et de Recherches Aerospatiales (ONERA), France

Filed Jun. 13, 1979, Ser. No. 48,255
Claims priority, application France, Jun. 15, 1978, 78 17965
Int. Cl.³ G01N *3/08*
U.S. Cl. 73—827 **10 Claims**

1. A method for measuring the bonding power of an adhesive material, particularly a sheet material comprising fibres impregnated with a glue, wherein, after having applied against the material the face of a totally reflecting prism the index of refraction of which is lower than that of the glue, a force is exerted which tends to bring apart from each other the prism



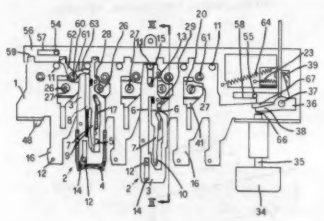
and said material, the value of the force corresponding to the separation is determined and the quotient is made of said force by the value of the contact area measured at the moment of the separation from the light totally reflected by said face.

4,232,560

KEYBOARD FOR THE PRESELECTION OF ELECTROMAGNETIC SIGNALS

Ezio F. Dellantonio, Rome, Italy, assignor to Autovox, SpA, Rome, Italy

Filed Nov. 9, 1977, Ser. No. 849,739
Claims priority, application Italy, Nov. 11, 1976, 52129 A/76
Int. Cl.³ F16H *35/18*
U.S. Cl. 74—10.33 **26 Claims**



1. A pushbutton keyboard tuning system for the tuning preselection of electromagnetic signals comprising:

a frame with means adapted to guide a number of keys for preselecting signals,

a tuning memorization latch whose position determines the selection of electromagnetic signals,

a key positioning bar for selectively maintaining each of said keys in at least an operative inserted position and a non-operative extracted position,

a slider for controlling clutch disengagement of said latch to a rotary knob tuning mechanism,

and in which each key comprises end of stroke stop means adapted to position the key at a predetermined position with respect to the frame in said operative position of said key,

a plunger linearly slidable on each key adapted to selectively position the tuning memorization latch,

means to lock the plunger in a predetermined slidable position on each key which determines the position of said tuning memorization latch when said key is in its operative inserted position, and means moveable with each key for acting on the slider controlling clutch-disengagement, and an improvement wherein,

each key comprises a flat slider portion provided with guide means for slidably guiding said plunger and provided with a resilient appendage forming part of said guide means and

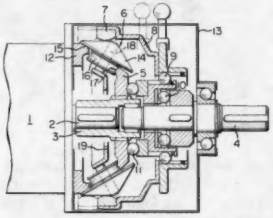
operable to selectively lock the slidable position of said plunger.

4,232,561

STEPLESS SPEED CHANGE GEAR

Manabu Kashihara, Kyoto; Kikuo Okamura, Koto; Yoshikata Muguruma, Koyto; Shizuo Yamano, and Shigeo Mizusawa, both of Kyoto, all of Japan, assignors to Shinpo Kogyo Kabushiki Kaisha, Kyoto, Japan

Filed Jun. 12, 1978, Ser. No. 914,762
Claims priority, application Japan, Jun. 14, 1977, 52-70079
Int. Cl.[2] F16H *15/16*
U.S. Cl. 74—191 **5 Claims**



1. A stepless speed change gear comprising:
an input member;
an output member coaxial with said input member;
a plurality of conical rollers;
a first member, a second member and a third member frictionally engaging said conical rollers;
a means for generating contact pressures between said conical rollers and said three members;
said first member comprising means for changing the speed of said output member and is moved in the common axial direction of said input member and said output member;
first annular power transmitting surface means comprising a substantially flat surface on the bottom of said conical roller and a second annular power transmitting surface of arcuate cross-sectional contour extending beneath said flat surface;
said flat and arcuate surfaces of said first annular power transmitting surface means being frictionally engaged with said second member and said third member, respectively;
said conical rollers being frictionally wedged between said first member and said second member by a force which is generated by said contact pressure generating means and which is transmitted through said third member.

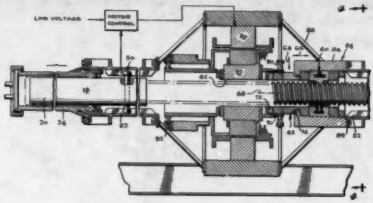
4,232,562

LEAD SCREW LINEAR ACTUATOR

Gerald S. Perkins, Altadena, Calif., assignor to California Institute of Technology, Pasadena, Calif.

Filed Nov. 16, 1978, Ser. No. 961,294
Int. Cl.[2] F16H *1/20*
U.S. Cl. 74—424.8 R **10 Claims**

1. A linear actuator, comprising:
a rod having a threaded portion;
a motor having a stator and a rotor;
a threaded nut means threadably engaging said threaded rod portion; and
a coupling which connects said rotor to said nut means, said coupling constructed to transmit torque about the axis of



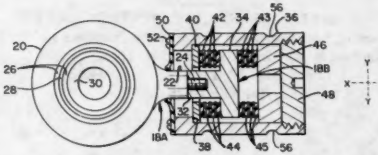
rotation of the rotor while permitting at least slight shifting of position of the nut means relative to the rotor.

4,232,563

LAMINATED ELASTOMERIC END BEARINGS FOR ARTICULATING LINKS

Robert R. Peterson, Hudson; Daniel S. Ventura, Malden, and Richard S. Gureghian, Burlington, all of Mass., assignors to Barry Wright Corporation, Watertown, Mass.

Filed Mar. 16, 1978, Ser. No. 887,204
Int. Cl.[2] G05G *25/00*; F16C *11/08*
U.S. Cl. 74—470 **52 Claims**



1. A rod end bearing assembly for coupling a connecting rod to a mechanical element comprising:
a first laminated elastomeric bearing unit comprising alternating elastomer and non-elastomer layers of cylindrical shape;
a second laminated elastomeric bearing unit comprising alternating elastomer and non-elastomer layers of non-cylindrical shape; and
a load transmitting member extending between and connected to said first and second elastomeric bearing units;
said first bearing unit being adapted to accommodate motion about the first of three predetermined axes and to react loading along the second or third of said three axes, said second bearing unit being adapted to react loading along said second axis and to accommodate motion about said second axis, and said load transmitting member having a longitudinal axis extending radially of the elastomer and non-elastomer layer of said first bearing unit and at an angle to the elastomer and non-elastomer layers of said second bearing unit.

4,232,564

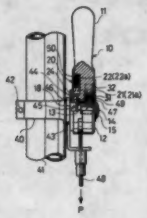
BICYCLE SPEED CHANGE LEVER DEVICE

Kazuto Yamasaki, Osaka, Japan, assignor to Maeda Industries, Ltd., Osaka, Japan

Filed Oct. 12, 1978, Ser. No. 951,017
Claims priority, application Japan, Oct. 14, 1977, 52-123828
Int. Cl.[2] G05G *5/06, 5/16, 5/18*
U.S. Cl. 74—475 **6 Claims**

1. A bicycle speed change lever device comprising;
a lever body pivotally mounted on a support shaft and having a handle portion and a base portion which is formed with internal hollow spaces,

a step positioning mechanism disposed at one side of said base portion and including a resiliently urged engaging piece and a plurality of engaging recesses arranged so as to cooperate for retainging said lever body in a selected speed gear position,



a one-way clutch mechanism disposed within said internal hollow spaces and including means for permitting said lever body to pivotally move in one direction with reduced frictional resistance, and

means for imparting frictional resistance to rotation of said lever body.

4,232,565

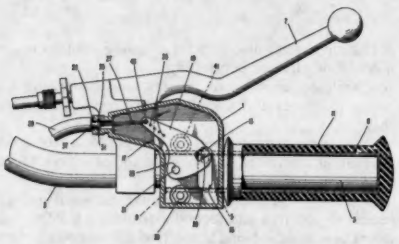
THROTTLE TWIST-GRIP CONTROL DEVICE

William H. Leonheart, San Carlos, Calif., assignor to McMinnville Tool & Die, Inc., McMinnville, Tenn.

Filed Aug. 17, 1978, Ser. No. 934,623

Int. Cl.[2] B62K *23/04*

U.S. Cl. 74—489 **10 Claims**



1. A remote control actuator for translating rotational angular movement into linear movement comprising: a housing; support partition means within said housing having a slot therethrough; a rotatable member arranged for rotational movement about an axis; projecting means rigidly mounted on said rotatable member and extending through said slot in said partition whereby the degree of rotation of the rotatable member is determined by the limits of said slot; a lever arm pivotally mounted on said support partition; means on said lever arm for movably engaging said projecting means whereby rotation of the rotatable member will cause said lever arm to move in a plane substantially parallel to the axis of rotation of the rotatable member; control actuator cable means including an inner cable member slidably movable with respect to a co-axially arranged outer cable member, said inner cable member being anchored upon and movable with said lever arm operative to oppose the movement of the outer cable member when said inner cable member is moved by said lever arm permitting relative movement between said cable members as said inner cable member is shifted in response to movement of said lever arm.

4,232,566

SWITCHING LEVER MECHANISM

Otto Lemke, Recklinghausen, and Manfred Krause, Herten-Langebochum, both of Fed. Rep. of Germany, assignors to Firma Carl Still, Fed. Rep. of Germany

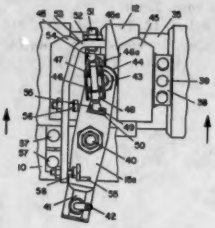
Division of Ser. No. 824,697, Aug. 15, 1977, Pat. No. 4,159,924.

This application Apr. 4, 1978, Ser. No. 893,421

Claims priority, application Fed. Rep. of Germany, Aug. 19, 1976, 2637314

Int. Cl.[3] F16H *53/06, 21/44*

U.S. Cl. 74—569 **1 Claim**



1. A switching lever mechanism for operating a switching lever between two end positions, comprising first and second laterally spaced apart cams, a follower lever pivotally mounted between its ends and including one end with a roller follower disposed between said cams, and an opposite end connectable to a member for shifting the member, a socket formed on said follower lever between the roller follower and the pivotal mounting thereof, a bolt having a spherical head pivotally mounted in said socket, a bracket mounted in a stationary position alongside said follower lever and having a set screw with a head portion, a sleeve pivotally mounted on said head portion and carrying said bolt, and spring means in said sleeve biasing said bolt outwardly, said sleeve being pivoted centrally between said cams so that when said follower lever is engaged in one end position, it will be biased by said spring into that end position, and when it moves beyond dead center or the pivotal location of the mounting of said sleeve, it will switch over and bias the lever into an opposite end position against the other of the cams.

4,232,567

POWER TRANSMISSION APPARATUS

Howard F. Hobbs, Napton, England, assignor to Variable Kinetic Drives Limited, England

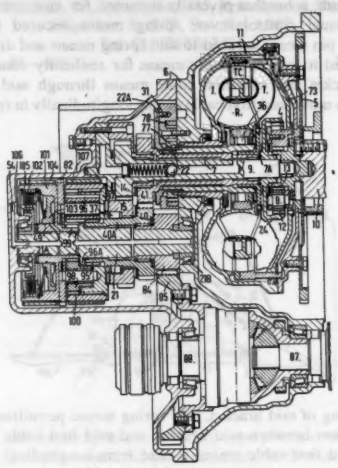
Filed May 20, 1977, Ser. No. 799,087

Int. Cl.[3] F16H *47/04, 47/08, 37/06*

U.S. Cl. 74—677 **3 Claims**

1. A power transmission apparatus comprising a torque converter having an input shaft, an impeller connected to the input shaft, an output sleeve, a layshaft parallel to said input shaft, an output member, an output turbine connected to said output sleeve, a reactor and a circulatory turbine, a first gearing connecting the circulatory turbine (TC) to the input shaft to transmit driving torque thereto, a unidirectional freewheel, a second gearing connecting the first gearing to the converter output sleeve through said unidirectional freewheel and a third gearing connecting the second gearing to said layshaft; a coupling shaft, said second gearing comprising first and second gearwheels the first of which is carried by said output sleeve and the second is carried by said coupling shaft which is coaxial with said output sleeve; third and fourth gearwheels carried by said layshaft, said first and second gearwheels meshing with said third and fourth gearwheels the third gearwheel being

connected with said third gearing and the fourth gearwheel is connected with the third gearwheel by said freewheel; and



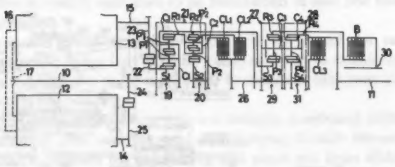
means drivably connecting the layshaft with said output member.

4,232,568

OUTPUT SPLIT-TYPE MECHANICAL AND HYDRAULIC TRANSMISSION

Hiroaki Maeda, Toyota, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Jun. 28, 1977, Ser. No. 810,790
Claims priority, application Japan, Jul. 6, 1976, 51/80619
Int. Cl.[2] F16H *47/04*
U.S. Cl. 74—687 **25 Claims**



1. The output split-type mechanical and hydraulic transmission comprising:

(a) an input shaft;

(b) an output shaft:

(c) an intermediate shaft:

(d) first and second hydraulic pump motors hydraulically connected to each other, and at least said first pump motor having a variable hydraulic capacity and being mechanically connected to said input shaft;

(e) a first differential gear mechanism having first and second planetary gears, each of said planetary gears comprising a sun gear, a ring gear, a pinion meshed with said sun gear and said ring gear thereof, and a carrier rotatably supporting said pinion thereof, and wherein said carrier of said second planetary gear is integrally connected to said input shaft and to said ring gear of said first planetary gear, said sun gears of said first and second planetary gears are integrally connected to each other and mechanically connected to said second hydraulic pump motor, and said carrier of said first planetary gear and said ring gear of said second planetary gear are selectively connected to said intermediate shaft;

(f) a second differential gear mechanism having third planetary gear with a sun gear, a ring gear, a pinion meshed with said ring gear and said sun gear thereof, and a carrier rotatably supporting said pinion thereof, and wherein said carrier of said third planetary gear is mechanically connected to said first hydraulic pump motor, said sun gear of said third planetary gear is integrally connected to said intermediate shaft, and said ring gear is selectively connected to said output shaft; and

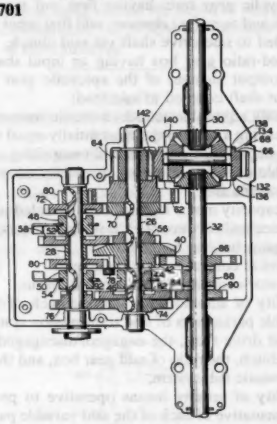
(g) clutch means for selectively connecting and disconnecting said ring gear of said second planetary gear to said intermediate shaft, said carrier of said first planetary gear to said intermediate shaft, said intermediate shaft to said output shaft, and said ring gear of said third planetary gear to said output shaft.

4,232,569

TRANSAXLE

Hans Hauser, Fredericktown, and William J. Clayborne, Mount Vernon, both of Ohio, assignors to The J. B. Foote Foundry Co., Fredericktown, Ohio

Filed Nov. 7, 1977, Ser. No. 849,011
Int. Cl.[2] F16H *37/08*
U.S. Cl. 74—701 **6 Claims**



1. A transaxle comprising a housing, an input shaft rotatably carried by said housing, a shifting shaft rotatably carried by said housing, output shaft means carried by said housing, a driven gear on said input shaft, a first power-transmitting gear on said input shaft, two power-transmitting gears on said output shaft means meshing with said driven gear and said first power-transmitting gear, additional gear means for transmitting power from said driven gear to said output shaft means at a first range of speeds and from said first power-transmitting gear to said output shaft means at a second range of speeds, and shift means operable outside said housing for mechanically connecting said driven gear and said first power-transmitting gear to said input shaft, one at a time, said housing being in two parts with said input shaft, said shifting shaft, and said output shaft means carried by said parts at the meeting line, said input shaft, said shifting shaft, and said output shaft means being in a common plane with said output shaft means and said shifting shaft being on opposite sides of said input shaft.

4,232,570

VARIABLE RATIO TRANSMISSION SYSTEMS

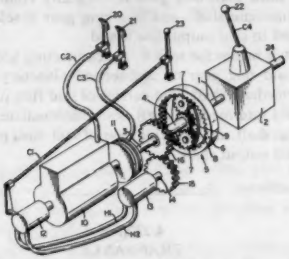
Peter J. Gibson, Guildford, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Dec. 22, 1977, Ser. No. 863,103

Claims priority, application United Kingdom, Dec. 22, 1976, 53641/76

Int. Cl.[2] B60K *41/16*

U.S. Cl. 74—866 **3 Claims**



1. A variable ratio transmission system for coupling a drive shaft of a prime mover to a load, including

a clutch;

an epicyclic gear train having first and second input elements and an output element, said first input element being coupled to said drive shaft via said clutch;

a stepped-ratio gear box having an input shaft coupled to said output element of the epicyclic gear train, and an output shaft coupled to said load;

a smoothly adjustable-ratio hydrostatic transmission subsystem having a ratio range substantially equal to the greatest ratio step of said gear box and comprising

a variable capacity pump mechanically coupled with said drive shaft, and

a fixed capacity motor hydraulically coupled with said pump and mechanically coupled to said second input element of the epicyclic gear train; and

an electrical control system including:

an operator-controlled load demand means,

a plurality of actuators for varying each of the following variable parameters of said transmission system: the speed of said drive shaft, the engaged/disengaged condition of said clutch, the ratio of said gear box, and the ratio of said hydrostatic sub-system,

a plurality of sensing means operative to produce signals representative of each of the said variable parameters, and

logic means responsive to input signals received from said sensing means and from said load demand means, and generating actuator command signals in an actuator drive circuit respective to each of said actuators.

4,232,571

FLOOR MOUNTED SHIFT CONTROL MECHANISM WITH DRIVE TRANSMITTING CABLES

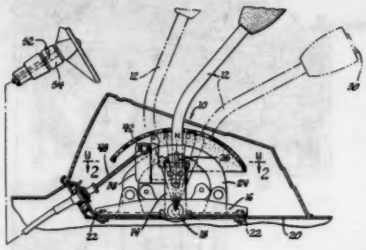
Dan R. Kimberlin, Frankenmuth, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 12, 1979, Ser. No. 11,396

Int. Cl.[3] B60K *41/04*

U.S. Cl. 74—878 **1 Claim**

1. A floor mounted manual transmission shift control mechanism for a vehicle having a steering column with a multiposition lock mechanism and a multiposition transmission mode control mechanism, said shift control mechanism comprising; a manual control lever; longitudinally movable first cable means operatively connected with the lock mechanism and being held from longitudinal movement when the lock mechanism is in a predetermined position; longitudinally movable second cable means operatively connected to a transmission mode control mechanism; a bracket pivotally mounted for movement with said manual control lever; spring means secured to said bracket, pin means secured to said spring means and drivingly connected to said first cable means for resiliently connecting said bracket and said first cable means through said spring means to move said first cable means longitudinally in response



to pivoting of said bracket, said spring means permitting relative motion between said bracket and said first cable means when said first cable means is held from longitudinal movement; and an extension integral with said bracket, said pin means also being operatively connected to said second cable means, and supported in said extension for transmitting motion from said bracket through said spring means and said pin means to said second cable means when said first cable means is free to move longitudinally.

4,232,572

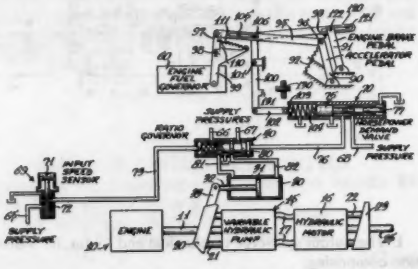
ENGINE-TRANSMISSION CONTROL SYSTEM

William A. Ross, and Frederic W. Pollman, both of Ames, Iowa, assignors to Sundstrand Corporation, Rockford, Ill.

Filed Jul. 17, 1978, Ser. No. 925,362

Int. Cl.[2] B60K *41/16*; F16D *31/02*

U.S. Cl. 74—859 **17 Claims**



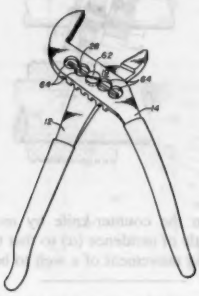
1. An engine-transmission control system for an engine utilizing no fuel control other than a fuel governor comprising, a variable hydrostatic transmission, a variable speed engine connected to said transmission, a fuel governor for said engine which provides an engine operating curve conforming to the locus of minimum fuel consumption of the engine and which establishes a particular engine horsepower at any particular engine speed, a horsepower demand signal valve, an engine speed signal valve, and means including a ratio governor valve responsive to horsepower demand and engine speed signals to set the transmission ratio of the hydrostatic transmission and control engine power delivery by action of the fuel governor resulting from the transmission ratio establishing an engine speed.

4,232,573

SLIP PLIERS WITH LOCK

Marvin H. Dace, Jr., Rte. 3, Box 665, Friendswood, Tex. 77511

Filed Jan. 8, 1979, Ser. No. 1,382
Int. Cl.³ B25B 7/04
U.S. Cl. 81—405 2 Claims



1. A new and improved set of slip type pliers, comprising:

two pivotally connected plier members, each member having an opposing gripping jaw and an elongated handle at the opposite end thereof;

a pivot pin mounted to the first plier member about which the second plier member rotates;

the second plier member having a slot therein for receiving the pivot pin to thereby permit the second plier member to slide relative to the first plier member therein enabling the second plier member to be manually adjusted about the pivot pin for rotation and positioning of such second plier member jaws relative to the jaws of said first plier member;

means for locking said pivot pin relative to said slot wherein said jaws may be moved relative to each other to enable gripping of a desired object only in one fixed position and wherein said pivot pin is prevented from sliding in said slot to enable said jaws to be maintained in said one fixed position,

means for unlocking said pivot pin relative to said slot, said pivot pin being free to slide within said slot to enable said gripping jaws to be readjusted to maintain said jaws in a different position;

said locking means being a dowel slidably positioned within the first plier member, said dowel being slidable between a first position for preventing said pivot pin from sliding within said slot to enable said jaws to be maintained in one fixed position, and a second position for releasing the plier members to enable said gripping jaws to be readjusted to maintain said jaws in a different position, said locking means including a resilient means mounted to said dowel for urging said dowel into its first position for retaining the plier members in a preset functional adjustment.

4,232,574

APPARATUS AND METHOD FOR PROVIDING A CIGARETTE FILTER WITH AN AERATION GROOVE

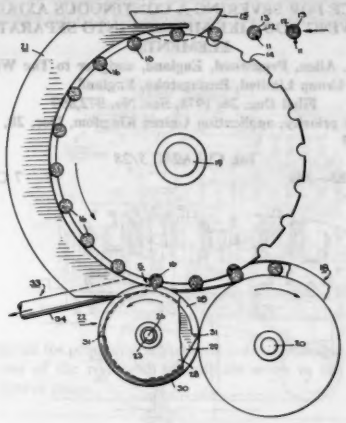
Floyd V. Hall, Durham, N.C., assignor to Liggett Group Inc., Montvale, N.J.

Filed Aug. 19, 1977, Ser. No. 826,136
Int. Cl.³ B23B 3/04, 5/14
U.S. Cl. 82—84 18 Claims

1. In an apparatus for providing an aeration groove in a filter plug having a layer of plug wrap paper circumferentially about a body of entrainment-type fibrous filter material, the combination comprising

a rotatable filter plug alignment drum having a plurality of peripherally disposed grooves for sequentially receiving and aligning a plurality of filter plugs,

a storage drum for sequentially receiving the filter plugs from said alignment drum, and



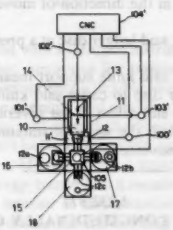
means adjacent said drums for forming at least one peripheral groove in each filter plug to extend through said plug wrap paper and being at least the depth of said plug wrap paper to communicate the exterior of the filter plug with the body of filter material.

4,232,575

ARRANGEMENT FOR PUNCHING OUT CIRCULAR BLANKS

Franz Schneider; Helmut Braitinger, both of Göppingen; Ewald Bergmann, Rechberghausen, and Otto Kurz, Hattenhofen, all of Fed. Rep. of Germany, assignors to L. Schuler GmbH, Fed. Rep. of Germany

Filed Nov. 16, 1978, Ser. No. 961,246
Claims priority, application Fed. Rep. of Germany, Nov. 16, 1977, 2751123
Int. Cl.³ B21D 28/22
U.S. Cl. 83—71 17 Claims



1. An arrangement for notching circular blanks, the arrangement comprising at least one notching machine, a rotatably mounted table means for supporting the blanks at the notching machine, a feeding and removing means, and an adjusting drive means for adjusting the notching machine in a first direction of movement radially with respect to a spatially fixed axis of rotation of the supporting table means, characterized in that an additional adjusting means is provided for selectively driving the supporting table means, in that means are provided for enabling a relative movement between the supporting table means and the at least one notching machine in a second direction of movement at a right angle to the first direction of

movement, and in that further means are provided for operating said feeding and removing device.

4,232,576

DEVICE FOR SEVERING A CONTINUOUS AXIALLY MOVING ROD-LIKE MEMBER INTO SEPARATE ELEMENTS

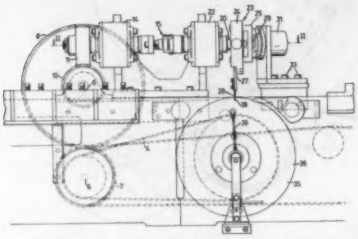
Roger A. Allen, Prestwood, England, assignor to The Wiggins Teape Group Limited, Basingstoke, England

Filed Dec. 26, 1978, Ser. No. 972,897

Claims priority, application United Kingdom, Dec. 28, 1977, 54024/77

Int. Cl.³ A24C *5/28*

U.S. Cl. 83—309 **7 Claims**



1. A device for severing a continuous rod-like member into separate elements during axial movement of the rod-like member along a predetermined path through a severance zone, comprising:

a ledger disc having a radially facing annular peripheral groove and a radial knife guide slot extending inwardly from the periphery of said ledger disc so as to intersect said groove, said ledger disc being rotatably mounted in a substantially vertical plane beneath said path for supporting said rod-like member substantially tangentially in said annular groove during passage through the severance zone;

a flexible cutting knife slidable cooperable with said knife guide slot in said ledger disc;

knife support means including a universal joint mounted adjacent to the severance zone and movable for causing said knife to follow an endless course intersecting said path at said annular groove with a component of motion along said path in the direction of movement of said rod-like member;

means for rotating said ledger disc at a predetermined speed; and,

means for driving said knife support means in synchronism with said ledger disc to cause said knife to pass thorugh said knife guide slot when in the severance zone and at a greater speed than the speed maintained during the remainder of its movement.

4,232,577

APPARATUS FOR LONGITUDINALLY CUTTING WEBS OF MATERIAL

Wilfried Wallmann, Lengerich of Westphalia; Manfred Menzel, Lengerich-Hohne, and Dieter Peschel, Lienen-Holzhausen, all of Fed. Rep. of Germany, assignors to Windmoller & Holscher, Lengerich of Westphalia, Fed. Rep. of Germany

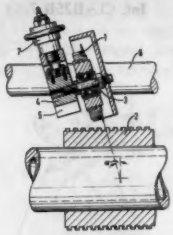
Filed Feb. 2, 1979, Ser. No. 9,175

Claims priority, application Fed. Rep. of Germany, Feb. 8, 1978, 2805211

Int. Cl.³ B23D *19/06*; B26D *1/24*

U.S. Cl. 83—496 **6 Claims**

1. Apparatus for longitudinally cutting webs of material, especially paper webs, comprising a freely rotatably mounted circular knife which can be applied to cutting edges of a grooved backing roller defining the counter-knife, characterised in that in the cutting position the circular knife (1) is inclined to the axis of the counter-knife (2) by an angle of incidence (α), and characterised in that the circular knife is



disengageable from the counter-knife by movement in the direction of the angle of incidence (α) so that the width of cut is changeable during movement of a web to be cut.

4,232,578

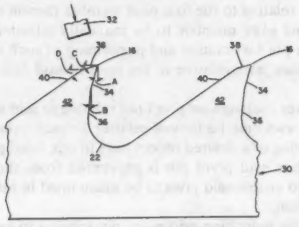
SAW BLADE AND METHOD OF MAKING

Thomas S. Stellinger, Weston, and Stephen R. Crosby, Sterling, both of Mass., assignors to Wallace Murray Corporation, Fitchburg, Mass.

Filed Jul. 9, 1979, Ser. No. 56,138

Int. Cl.³ B27B *33/06*

U.S. Cl. 83—661 **9 Claims**



1. A saw blade in which each tooth comprises

a primary rake face extending from the tooth tip for a distance of 0.007 to 0.020 inch and having a positive rake angle of 12° to 25°,

a secondary rake face extending from the primary rake face to the gullet of the tooth and having a positive rake angle of less than 12°,

a primary end relief surface extending from the tooth tip for a distance of 0.007 to 0.030 inch and forming a relief angle of 10° to 25°, and

a secondary end relief surface extending from said primary end relief surface to the gullet of the next succeeding tooth of said blade and forming a relief angle greater than that of said primary end relief surface.

4,232,579

SWITCH ACTUATING ASSEMBLY FOR POWER TOOLS

Peter J. Craddock, Oldham; Brian R. Law, Leicester, and Albert J. Smith, Nuneaton, all of England, assignors to Burgess Power Tools Limited, Great Britain

Filed Jan. 31, 1979, Ser. No. 8,109

Int. Cl.³ B26D *5/00*; B27B *13/00*; B27G *19/06*

U.S. Cl. 83—788 **7 Claims**

1. Power tool having an electric motor, a component mounting the motor and a drive mechanism for a tool implement characterised in that a box-shaped moulding of synthetic material mounts, apart from a motor and a drive mechanism for an

implement, also a switch actuating assembly flush in a side of the moulding, said assembly comprising an OFF actuating

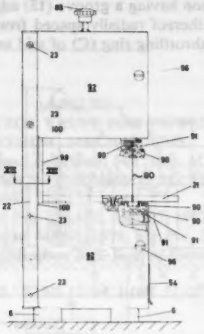


plate pivotably mounted in a recess in the side and covering an ON actuating plate to which access can be gained by pivoting the OFF actuating plate upwards.

4,232,580

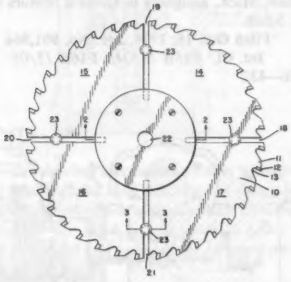
CIRCULAR SAW BLADE

John S. Stewart, P.O. Box 5670, Greensboro, N.C. 27403

Filed Nov. 6, 1978, Ser. No. 957,859

Int. Cl.³ B27B *33/08*

U.S. Cl. 83—835 **7 Claims**



1. A circular saw blade comprising a circular disk having opposite flat faces and a plurality of circumferentially spaced cutting teeth, said blade having a plurality of circumferentially-spaced and radial slots extending in said blade to a depth at least half the radius of said blade forming blade segments, and collar means for central clamping against at least one flat face of said disk and partially overlapping said slot whereby vibrational energy is damped.

4,232,581

AUTOMATIC ACCOMPANIMENT APPARATUS

Yasuji Uchiyama, Hamakita, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Continuation of Ser. No. 659,070, Feb. 18, 1976, abandoned. This application Apr. 12, 1978, Ser. No. 895,697

Claims priority, application Japan, Feb. 21, 1975, 50-21668; Feb. 28, 1975, 50-24524; Feb. 28, 1975, 50-24525; Feb. 28, 1975, 50-24526

Int. Cl.³ G10H *1/38, 1/42*

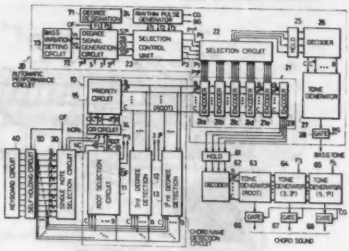
U.S. Cl. 84—1.03 **8 Claims**

1. An automatic accompaniment apparatus comprising:

a circuit for producing signals representing the root and subordinate notes of a chord;

a circuit for designating a predetermined bass degree change pattern;

a circuit for detecting, in accordance with the designated degree change pattern, which one of a plurality of octave ranges the root and subordinate notes belong to; and



a circuit for producing a bass tone corresponding to frequencies of the root and subordinate notes in the detected octave range.

4,232,582

ACOUSTICAL STRINGED MUSICAL INSTRUMENT PICK-UP

Marc Diamond, Wildcat Hill Rd., Harwinton, Conn. 06791

Filed Apr. 4, 1979, Ser. No. 26,873

Int. Cl.³ G10D *1/08;* A61B *7/02*

U.S. Cl. 84—267 **23 Claims**

1. In combination with a stringed instrument having a bridge and a string anchor, apparatus for transmitting acoustical energy to a listener comprising a flexible energy pick-up chamber having at least one opening, said chamber being located in said bridge, so that one wall of said chamber provides support for the strings and there being substantially no soft, sound damping material between said wall and the strings; at least one elongated, hollow energy transmission member having a first end connected to the interior of said chamber through said opening; and listening means for transmitting said energy to a listener, said means being mounted on a second end of said hollow member.

4,232,583

FIREARM WITH RECOIL MOVEMENT DELAYING MECHANISM

Donald G. Harrison, 5927 W. Rose La. #C, Glendale, Ariz. 85301

Filed Dec. 14, 1978, Ser. No. 969,382

Int. Cl.³ F41D *5/02, 5/04, 11/06*

U.S. Cl. 89—153 **12 Claims**

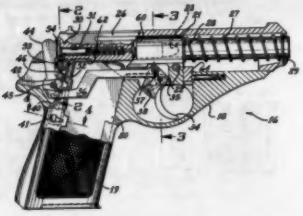
1. An automatic or semiautomatic firearm comprising in combination:

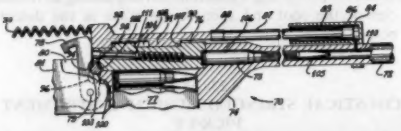
(a) a frame;

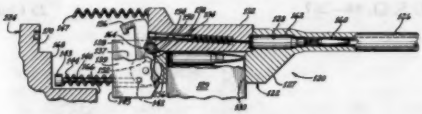
(b) a recoiling breechlock on said frame and longitudinally reciprocally movable relative to said frame between a breech opening position and a breech closing position;

(c) roller means mounted in said frame and reciprocally movable into and out of the movement path of said recoiling breechblock;

(d) means in said frame for reciprocally mounting said roller means therein; and







(e) a hammer pivotably mounted in said frame for movement from a cocked position to a fallen position, said hammer having a cam surface formed on its leading edge which is disposed to engage said roller means upon movement of said hammer to its fallen position to drive said roller means into the movement path of said recoiling breechblock to delay movement thereof to its breech opening position.

4,232,584

CONTROL ELEMENT FOR AUXILIARY POWER STEERINGS

Rolf Fassbender, Mutlangen, Fed. Rep. of Germany, assignor to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Fed. Rep. of Germany

Filed Feb. 22, 1979, Ser. No. 13,908

Claims priority, application Fed. Rep. of Germany, Feb. 22, 1978, 2807464

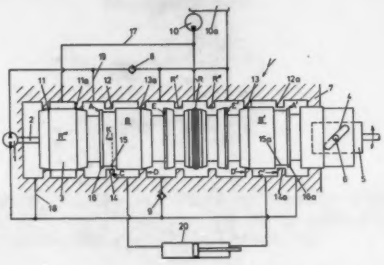
Int. Cl.³ F15B *11/08*

U.S. Cl. 91—418 **5 Claims**

1. In a control valve for a power steering system, said control valve being of the kind having a valve sleeve (7) and a valve piston (3) shiftable therein by rotation of a steering spindle (5) and including flow control rings and grooves of said valve piston coacting with flow control rings grooves and flow passages of said valve sleeve to control pressure flow from a metering pump (1) actuated by said steering spindle to a power cylinder (20) and exhaust therefrom:

the improvement which comprises:

at least one throttling ring (A) on said valve piston and at least one throttling ring (C) on said valve sleeve effecting a throttling flow passage therebetween for pressure flow to a power cylinder wherein said pressure flow has initial low throttling in the shifting of said valve piston starting from a netural position with initial low pressure in said power cylinder to high throttling upon pressure increasing in said cylinder as said valve piston is shifted; said valve piston having a groove (15) adjacent the throttling ring (A) thereof radially spaced from and axially wider than the throttling ring (C) of said valve sleeve to effect



low throttling in initial steering control shifting of said valve piston from said neutral piston; said throttling rings being mutually dimensioned to effect maximum throttling during high pressure flow when the throttling ring (A) of said valve piston is adjacent the throttling ring (C) of said valve sleeve.

4,232,585

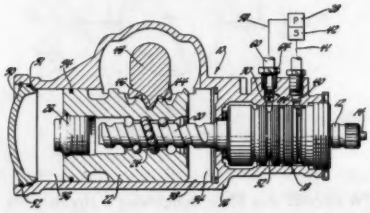
POWER STEERING GEAR WITH FLOW CHECK VALVE

James M. Shea; Michael F. Tobin, and Stanley E. Anderson, all of Saginaw, Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 16, 1978, Ser. No. 951,964

Int. Cl.³ F15B *13/042*; F16K *15/06*

U.S. Cl. 91—432 **4 Claims**



1. A hydraulic power unit comprising a housing, a piston mounted for sliding movement in said housing and cooperating therewith to form a pair of expansible and contractible fluid chambers, output means operatively connected to said piston and extending from said housing, a source of fluid pressure, a pressure port and an exhaust in said housing, a fluid passage tube operatively connecting said source to said pressure port, said tube having one end seated in said pressure port, said tube extending externally of said housing and having its other end connected to said source, manual input means extending into said housing, valve means connected to said input means hydraulically connected to said pressure port and said exhaust, said value means being operatively mounted in said housing to feed and exhaust fluid from said fluid chambers, a one-way check valve in said pressure port, said one-way check valve comprising a valve element and a spring for biasing said valve element in one direction and a retainer for said spring and valve element, said valve element being operatively connected to said spring and retainer to form a unitized assembly, said valve element having a head portion, and valve seat means formed directly in said one end of said fluid passage tube to

cooperate with said head portion to block the fluid flow fromm said chamber to said source of pressure to prevent external loads imposed on said output means from being fed through said gear to said input.

4,232,586

STEERING CONTROL VALVE FOR POWER BOOSTER STEERING MECHANISMS

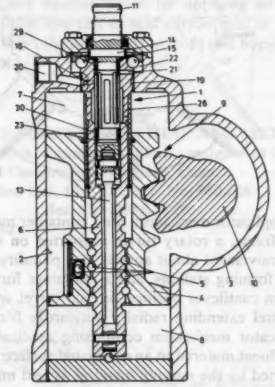
Dieter Elser, Essingen-Lauterburg, Fed. Rep. of Germany, assignor to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Fed. Rep. of Germany

Continuation of Ser. No. 825,477, Aug. 17, 1977, abandoned. This application May 8, 1979, Ser. No. 37,031

Claims priority, application Fed. Rep. of Germany, Aug. 20, 1976, 2637458

Int. Cl.³ F15B *13/04*; F16K *11/00*

U.S. Cl. 91—467 **1 Claim**



1. In a booster steering mechanism system including a boost cylinder and piston of the kind described, a rotary valve plug having dead end grooves and a worm shaft effecting a valve sleeve having interior dead end grooves to coact with said rotary valve plug dead end grooves for oil pressure flow control;

said rotary valve plug being rotative within a bore through said valve sleeve for flow control and being disposed to be subjected to sidewise forces of oil pressure and steering mechanism stresses;

an anti-friction roller bearing adjacent each end of the rotary valve plug proximate the ends of the dead end grooves therein and rotatively and fixedly supporting said rotary valve plug in said valve sleeve bore with a predetermined fixed radial clearance to permit smooth and uniform low resistance to rotation while minimizing oil leakage between the rotary valve plug and valve sleeve bore, whereby said sidewise forces acting on said rotary valve plug are resisted to preclude eccentricity thereof in said valve sleeve bore to thereby prevent frictional engagement of said rotary valve plug with said valve sleeve;

wherein said bearings comprise needle rollers in slotted cages arrayed in a circle which has an outer diameter predeterminedly larger than the outer diameter of the rotary valve plug to effect said predetermined clearance between said rotary valve plug and said valve sleeve bore; said needle rollers being radially supported continuously between the walls of said valve sleeve bore and said valve plug and providing the sole means of radial support for said valve plug.

4,232,587

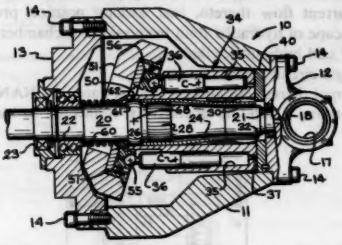
FLUID PUMP

William L. Kline, Galena, Ohio, assignor to Kline Manufacturing Co., Galena, Ohio

Filed Apr. 25, 1979, Ser. No. 33,191

Int. Cl.³ F01B *13/04*

U.S. Cl. 91—499 **5 Claims**



1. In a hydraulic fluid pressure transducing device comprising a housing having two ends a port cap seated on one end of said housing and having inlet and discharge ports, an end bell seated on the end of said housing opposite said port cap, a drive shaft disposed within said housing and extending therefrom, bearing means for said shaft disposed in said port cap, a second bearing means for said shaft disposed in said end bell, a rotatable barrel disposed generally concentrically about said shaft and defining a plurality of uniformly spaced parallel cylinders in communication with both ends of said barrel, a plurality of pistons with one positioned in each of said cylinders, a swash plate disposed adjacent one end of said barrel and inclined about an axis skewed to the barrel axis, ball and socket means disposed intermediate said pistons and said swash plate for reciprocating said pistons, a valve plate adjacent the end of said barrel opposite said swash plate having arcuate inlet and outlet fluid passages in independent communication with said inlet and outlet ports, and drive means disposed between said shaft and said barrel for transferring rotary motion therebetween, the improvement comprising a splined interconnection between said shaft and said drive means and a second splined interconnection between said drive means and said barrel, at least one of said splined interconnections having generally a spherically profiled male spline.

4,232,588

ELECTRICALLY CONTROLLED PIPE FRACTURE SAFETY DEVICE

Herbert Ziplies, Kamen, and Werner Pyschik, Dortmund, both of Fed. Rep. of Germany, assignors to O & K Orenstein & Koppel Aktiengesellschaft, Berlin, Fed. Rep. of Germany

Filed Feb. 17, 1978, Ser. No. 878,915

Claims priority, application Fed. Rep. of Germany, Feb. 23, 1977, 2707630

Int. Cl.³ F15B *11/00*

U.S. Cl. 91—518 **4 Claims**

1. An electronically controlled pipe fracture safety device for operating devices which are fed by a hydraulic pump and which are actuated by a control slide valve by means of hydraulic cylinders, comprising

a hydraulic system comprising,

a hydraulic pump,

hydraulic cylinders being operatively connected to the operating devices,

first lines leading from said hydraulic pump to a first chamber of each of said hydraulic cylinders, respectively,

a first control slide valve operatively connected to said first lines between said hydraulic pump and said hydraulic cylinders,

control lines branching off from said first lines, respectively,

means comprising a differential pressure monitor connected

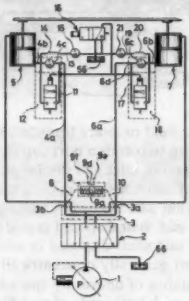
to said control lines and having a slidable differential pressure actuated piston, said means for monitoring the entire hydraulic system,

a permanent magnet secured to said piston,

a control slide valve means operatively fed with and operatively controlled by a current flow and operatively connected to said hydraulic cylinders, said control slide valve means for being in a locking position thereof without current flow thereto, said locking position preventing escape of hydraulic fluid from said first chamber of each of said hydraulic cylinders,

a logic circuit means including,

an input thereto comprising a NOR gate, and NAND gates forming a flip-flop operatively connected to said NOR



gate, a relay operatively connected to said flip-flop and to said control slide valve means,

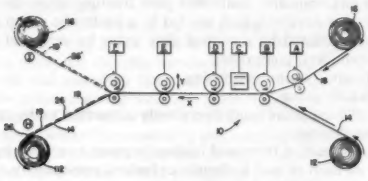
said logic circuit means including a reed contact switch means operatively connected to said NOR gate and cooperatively disposed adjacent said permanent magnet, such that upon a pressure difference between said control lines upon leakage in one of said first lines, said piston is displaced by the pressure difference and said magnet actuates said reed contact switch means so that a signal is produced in said NOR gate, whereupon said signal retransmitting a self-locking signal to said NAND gates causing a locking position of said NAND gates, in turn causing a drop-out of said relay and an interruption of the current flow to said control slide valve means and effecting the locking position of the latter.

4,232,589

METHOD OF MAKING PLASTIC BAG CONSTRUCTION IN SERIAL ROLL FORM

Edwin F. Ernst, 3722 Buckingham Dr., Roanoke, Va. 24018

Division of Ser. No. 841,441, Oct. 12, 1977, Pat. No. 4,171,048.
This application Jan. 24, 1979, Ser. No. 6,239
Int. Cl.³ B31B *27/00*
U.S. Cl. 493—223 **10 Claims**



1. A method of making a plurality of serially connected bag structures in package roll form having the following steps:

supplying a first strip of indeterminate length,

attaching short determinate length strips from a second supply of strip material at spaced points along said first strip,

forming a Z-fold expansion gusset closely adjacent to each point of attachment, and

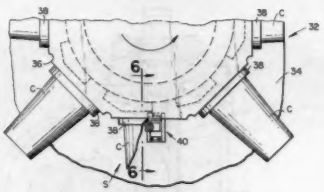
sealing the side edges together of the first member of indeterminate length and the spaced second members of determinate length to form individual bag structures, together with the additional step of tack sealing the side edges of the formed gusset prior to the edge sealing of the individual bag structures.

4,232,590

CUP MAKING MACHINE HAVING APPLICATOR MECHANISM

Warren E. Johnson, Bristol, Conn., assignor to Sherwood Tool, Incorporated, Kensington, Conn.

Filed Dec. 13, 1978, Ser. No. 968,986
Int. Cl.³ B31B *1/62*
U.S. Cl. 493—10 **10 Claims**



1. An applicator mechanism for a container making machine having a frame, a rotary turret supported on said frame for indexing movement about an axis to a plurality of successive container forming stations, and a container forming mandrel mounted in cantilever position on said turret with the axis of said mandrel extending radially outwardly from said turret, said applicator mechanism comprising applicator means for applying fluent material to an associated surface of a container blank carried by the moving mandrel as said mandrel indexes from one to another of said forming stations, said associated surface being disposed generally within a radial plane relative to the axis of said turret, means supporting said applicator means for movement relative to said turret, and means for moving said applicator means in material applying relation to a moving container blank carried by said moving mandrel in response to the indexing movement of said turret relative to said frame to apply a rectilinear strip of the fluent material to said associated surface of said moving container blank.

4,232,591

CARTON ERECTING APPARATUS

William J. Karpinsky, Audubon, Pa., assignor to Container Corporation of America, Chicago, Ill.

Filed Jan. 22, 1979, Ser. No. 5,303
Int. Cl.³ B31B *1/80*
U.S. Cl. 493—314 **2 Claims**

1. An apparatus for erecting carton tubes formed from foldably connected panel elements, said apparatus comprising:

(a) a hopper for holding a plurality of carton tubes in flattened condition;

(b) a conveyor adapted to receive an erected carton tube and having means for retaining said tube in an erected condition;

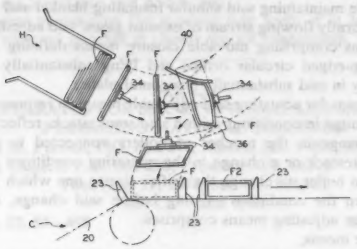
(c) a carton tube erecting and transfer structure mounted for movement in a path between said hopper and said conveyor for delivering an erected carton tube to said conveyor;

(d) said last named structure including:

(i) vacuum pick-off and transfer means movable in timed relationship to said conveyor for engaging a panel element of said tube disposed at said hopper;

(ii) said vacumm pick-off and transfer means moving in an arcuate path between said hopper and said conveyor;

(iii) stationary plenum means positioned along the path of travel of said carton tubes and located remote from and free from attachment to said hopper and acting at least



during a portion of said movement of said vacuum pick-off and transfer means for applying air pressure upon at least one end of said carton tube to erect the same as said tube is transferred from said hopper to said conveyor.

4,232,592

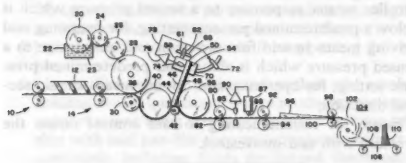
ENVELOPE FORMING MACHINE AND METHOD

David L. Gingerich, Farmington, Mich., assignor to Champion International Corporation, Stamford, Conn.

Filed Oct. 12, 1978, Ser. No. 950,626

Int. Cl.³ B31B *1/20*

U.S. Cl. 493—10 **3 Claims**



1. A machine for serially handling, gluing and shaping envelope blanks comprising:

a. a scoring roller for receiving said blanks and adding score lines thereto,

b. means for receiving said blanks from said scoring roller and applying glue to selected first locations on said blanks, said last named means including

(i) a drive roller and a glue application roller in operative association therewith to apply glue to selected areas of an envelope blank passing between said rollers,

(ii) a first photo cell for detecting the presence of said blank and producing a first output signal when said blank is present,

(iii) means coupled to said first and second photo cells for moving said drive roller out of contact with said application roller when only said second output signal is present,

c. means receiving said blanks with applied glue and folding said blanks to cause a seal at said glue locations,

d. means for receiving said folded blanks and inverting said blanks whereby a first portion of said blanks is stationary while said blanks are being inverted,

e. means located at said inverting means for forming a desired shape in said stationary portion of each of said blanks while said blanks are being inverted, and

f. means for receiving said shaped blanks and folding said blanks to form completed envelopes.

4,232,593

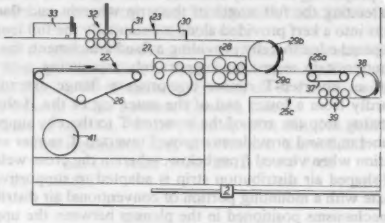
IMPROVEMENTS IN AND RELATING TO THE MANUFACTURE OF RECORD SLEEVES

Norman J. Garrod, Great Common, Bletchingley, Surrey, England

Filed Dec. 11, 1978, Ser. No. 968,213

Int. Cl.³ B31B *1/08*

U.S. Cl. 493—224 **5 Claims**



1. A machine for making single and double record sleeves made respectively from one and two sheet material blanks, said machine comprising:

two input lines each comprising blank registering means, blank cutting means and blank creasing means;

two first output lines each comprising means for producing a single record sleeve from a cut and creased blank;

a second output line including means for producing a double record sleeve from two cut and creased blanks;

conditioning means having a first and a second condition, in the first condition of which each said input line is connected to a respective one of said two first output lines and in the second condition of which both said input lines are connected to said second output line, wherein each said input line and said respective first output lines are arranged one above the other and said conditioning means comprises, in respect of each said input line, a diverter which in said first condition is arranged to divert a blank from said respective input line to said respective first output line.

4,232,594

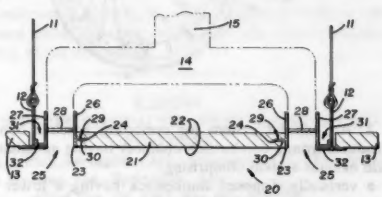
MODULAR CEILING PANEL UNIT USABLE WITH AIR DISTRIBUTION SYSTEMS

Albert F. Kuhr, Elk Grove Village, Ill., assignor to United States Gypsum Company, Chicago, Ill.

Filed Jul. 27, 1978, Ser. No. 928,770

Int. Cl.³ F24F *7/00*

U.S. Cl. 98—40 D **3 Claims**



1. A ceiling panel unit adapted for use with conventional air distribution mechanisms in suspended ceiling grid systems utilizing inverted-T runners suspended from upper support structures forming a plenum between the upper support structure and ceiling grid system, said ceiling panel unit having a body portion having a generally rectangular configuration with opposite parallel panel faces, said body portion having four marginal edges, wherein at least two opposite edges have

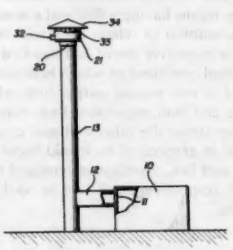
generally H-shaped integral air distribution strips having an inner leg, an outer leg, and a cross-web portion therebetween, fixedly engaged thereto for substantially the full length of the edge, said air distribution strips comprising means along the inner leg of the H-shape engaging the panel body portion edge and means at the outer leg of the H-shape for supportively associating with the arm of an inverted-T runner, at least one air distribution strip panel edge engaging means comprises a flange projecting inwardly from the inner leg of the H-shape and extending the full length of the strip wherein said flange projects into a kerf provided along substantially the full length of the panel edge thereby providing a fixed attachment, the air distribution strip means for supportively associating with an arm of an inverted-T runner comprises a flange extending outwardly from a lower end of the outer leg of the H-shape and resting atop the arm of the inverted-T to thereby support the panel unit and provide an exposed inverted-T runner configuration when viewed from below, wherein the cross-web of the H-shaped air distribution strip is adapted to supportively associate with a mounting portion of conventional air distribution mechanisms positioned in the plenum between the upper support structure and ceiling grid system.

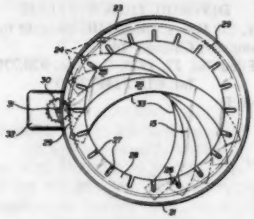
4,232,595

EXHAUST SYSTEM FOR SMOKESTACK

Norman D. Cox, Lansing, Ill., assignor to Jefco Laboratories, Incorporated, Chicago, Ill.

Filed Jun. 15, 1978, Ser. No. 915,941
Int. Cl.[3] F23J *13/00*; F23L *17/02*
U.S. Cl. 98—59 **3 Claims**





1. An exhaust system for removing gaseous combustion products from a combustion chamber having an exhaust port, said exhaust system comprising:

a vertically disposed smokestack having a lower portion communicating with the exhaust port of said combustion chamber and a top opening communicating with the atmosphere;

an exhaust control device overlying said top opening of the smokestack;

said exhaust control device being substantially flat and lying in a substantially horizontal plane and having a sharp-edged circular orifice overlying the interior of said smokestack;

said exhaust control device comprising means for forming an annular insulating blanket of exhaust gases around the periphery of the smokestack interior and a uniformly flowing stream of exhaust gases passing steadily up the center of the annulus;

said substantially flat exhaust control device comprising adjustable means actuable to adjust the size of said orifice while maintaining said annular insulating blanket and said uniformly flowing stream of exhaust gases, said adjustable means comprising movable closure means defining said sharp-edged circular orifice and lying substantially entirely in said substantially horizontal plane;

and means for actuating said adjustable means in response to a change in conditions within said smokestack, reflecting a change in the number of boilers connected to said smokestack or a change in the operating conditions in a given boiler, to change the orifice size to one which will return the conditions existing before said change, said orifice adjusting means comprises:

closure means;

and means mounting said closure means for movement between a first position in which said orifice has a first cross-sectional area less than the cross-sectional area of said smokestack and a second position in which said orifice is partially open and has a second cross-sectional area less than said first cross-sectional area thereof,

said closure means comprises means for adjusting the cross-sectional area of said orifice uniformly around the periphery of the aperture,

said closure means comprises an iris-type structure,

said actuating means comprises means responsive to a change in pressure within said smokestack, said pressure-responsive actuating means comprises:

driving means operable in a first direction to close said closure means and operable in a second direction to open said closure:

controller means, responsive to a sensed pressure which is below a predetermined pressure setting, for operating said driving means in said first direction and, responsive to a sensed pressure which is above said predetermined pressure setting, for operating said driving means in said second direction;

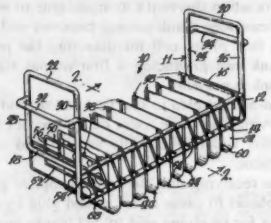
and means for communicating to said control means the pressure with said smokestack.

4,232,596

LOW HEAT CAPACITY FRY BASKET ASSEMBLY

Steve Kroll, Schaumburg, and James C. Schindler, Naperville, both of Ill., assignors to Restaurant Technology, Inc., Oak Brook, Ill.

Filed Nov. 29, 1978, Ser. No. 964,789
Int. Cl.[3] A47J *37/12*
U.S. Cl. 99—410 **9 Claims**



1. A low heat capacity fry basket assembly for holding a plurality of comestible articles in a spaced apart relationship when immersed in a bath of cooking liquid, said assembly comprising:

a rigid frame having spaced-apart transverse support members;

a non-metallic, flexible sheet forming pouches hanging from said support members for receiving and holding said comestible articles, each said pouch having at least a pair of opposed sidewalls and a bottom portion together defining said pouch with open ends and an open top, said sidewalls having a plurality of apertures therein to admit said cooking liquid into said pouch; and

means maintaining the opposed side walls of at least two adjacent pouches in closely spaced relationship.

4,232,597

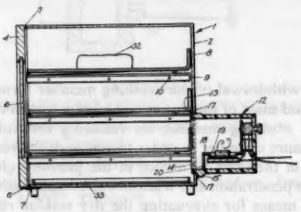
APPARATUS FOR SMOKING FOODS AND SMOKE PRODUCING MATERIAL THEREFOR

Paul M. Perrine, P.O. Box 270, Aurora, Ind. 47001, and James A. Cassera, P.O. Box 290, Prescott, Ariz. 86302

Filed May 11, 1978, Ser. No. 904,881

Int. Cl.³ A23B *4/04*

U.S. Cl. 99—468 **12 Claims**



1. A smoker for quickly imparting a smoked flavor to comistibles and the like comprising:

(a) a receptacle including means for introducing the comistible into the interior of the smoker and an opening in said receptacle for attaching a smoker unit thereto;

(b) means within said receptacle for supporting the comistible;

(c) a pan-like support positioned within said smoker for holding a small quantity of smoke producing material, said support means being positioned in non-overlying relationship with said pan-like support to prevent any part of the comistible, including fluids discharged therefrom, from contacting said pan-like support;

(d) means adjacent said pan-like support for heating the smoke producing material to a temperature sufficient to produce a desired quantity of smoke, but resulting in a relatively small temperature rise within said receptacle; and

(e) a smoker unit comprising an enclosure having an opening therein and means for removably attaching said smoker unit to the exterior of said receptacle with said smoker unit opening coextensive with said receptacle opening such that the interior of said enclosure communicates with the interior of said receptacle, said pan-like support and said heating means being located within said enclosure, and attaching means comprising a first outwardly directed flange-like lip extending partly around the periphery of said smoker unit opening and the secondly outwardly directed flange-like lip extending around the remaining periphery of said smoker unit opening, the surface of said first lip facing away in the opposite direction to said smoker unit opening and being adapted to abut the interior wall of said receptacle adjacent said receptacle opening, said second lip facing in the same direction as said smoker unit opening and being adapted to abut the exterior wall of said receptacle adjacent said receptacle opening, said enclosure being attachable to said receptacle by inserting said first lip within said receptacle opening such that a portion of said wall abutting surface of said first lip abuts said interior wall and pivoting said enclosure to move said second lip towards said receptacle opening, the weight of said smoker unit pivoting about said interior wall holding and substantially sealing said wall abutting surface of said second lip against said exterior wall adjacent said receptacle opening,

said smoker being substantially airtight to prevent escape of smoke therefrom for rapidly imparting the smoked flavor to the comistible.

4,232,598

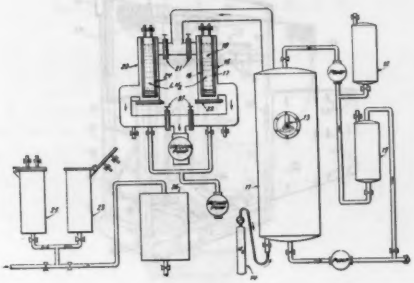
APPARATUS FOR THE DEAROMATIZATION OF COFFEE OIL

Gerald S. Hurlow, Toronto; Jean R. Blain, Montreal; Michael Coombes, Pointe Claire; Jean-Claude Richard, Chateauquay, and Patrick W. Hitchinson, Dorval, all of Canada, assignors to General Foods Limited, Toronto, Canada

Division of Ser. No. 757,167, Jan. 6, 1977, Pat. No. 4,101,681. This application May 1, 1978, Ser. No. 901,383

Int. Cl.³ A23F *5/50*; B01D *3/10, 7/02*

U.S. Cl. 99—483 **11 Claims**



1. A condenser which comprises:

a heat-conductive sleeve removably and snugly surrounding a heat-conductive container, the container having a coolant therein, and

a condensing chamber enclosing said heat-conductive sleeve, said condensing chamber having ports for the passage of a gas stream within the space between the sleeve and the condensing chamber, and said condensing chamber having a removable cover which seals an opening through which the sleeve is passed when removed from the container.

3. An apparatus for the separation and recovery of gas stream constituents comprising:

a distillation chamber wherein a coffee oil is subject to distillation at sub-atmospheric pressures and mild temperatures to obtain a gas stream of aroma constituents therefrom; and

the condenser of claim 1, the aroma constituents being condensed onto the outer surface of the heat-conductive sleeve of the condenser.

4,232,599

WASTE PAPER COMPACTER WITH FRONT ACCESS FEATURES

James A. Ulrich, Springdale, Ark., assignor to J. V. Manufacturing & Welding, Inc., Springdale, Ark.

Filed Oct. 19, 1978, Ser. No. 952,638

Int. Cl.² B65B *13/06*; B30B *15/32*

U.S. Cl. 100—25 **14 Claims**

1. In a compactor apparatus comprising a cage with a door and a compacting ram for forming bales of waste material, the improvement of a bale ejector comprising,

a tiltable floor element in the bottom of said cage pivotable about an axis near the vertical plane of said door and parallel thereto,

a vertical link engaging the rear of said floor element with its

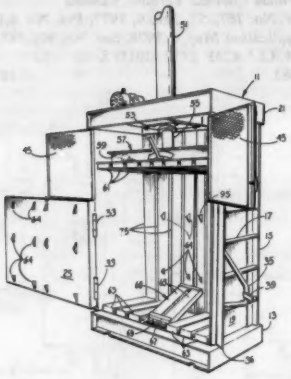
bottom and extending upwardly to a height at least slightly greater than the bale height,

said link having a hook on the upper portion thereof,

a latch member connected to move with said compacting ram and adapted to engage the hook of said link when the compacting ram is moved from its lower position to its upper position,

said latch member being movable between an operative position and an inoperative position at which it does not engage the hook of said link,

said latch member including a shaft extending along the top center of said ram from the door side thereof to the opposite side thereof, a handle on the door end of said shaft and an arm on the opposite end of said shaft, said arm being



positioned to be movable into and out of an engagement position with the hook of said link, and

a toggle element fixed relative to said cage adapted to move said latch member to the inoperative position upon downward movement of said ram,

said toggle element being provided with a ramp shaped lower portion and an approximately horizontal upper portion and said shaft of said latch member being spring loaded away from said door and towards said toggle element and said toggle element being positioned to strike said arm causing it to rotate to an inoperative position when the motion of said arm is downward and causing it to slide over said ramp portion without rotation when said ram motion is upward.

4,232,600

PROCESS AND APPARATUS FOR TREATING MATTER COMPRISING A SOLID PHASE AND A LIQUID OR PASTY PHASE

Gwenole Le Jeune, Montreuil, France, assignor to Societe Civile Hydromer, Paris, France

Filed Nov. 28, 1977, Ser. No. 855,299

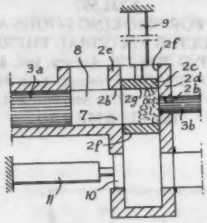
Claims priority, application France, Dec. 6, 1976, 73 36700; May 4, 1977, 77 13587

Int. Cl.[2] B30B *9/02, 9/06*

U.S. Cl. 100—37 **24 Claims**

1. An apparatus for carrying out a process for the treatment of matter comprising a solid phase and a liquid or pasty phase and of the type according to which said pasty phase is crushed and the resulting crushed matter is sifted under pressure, said apparatus comprising:

a pressure chamber defined by a wall, supply means for introducing the matter to be treated into the pressure chamber, means defining calibrated passages connecting the inside of the pressure chamber to at least one chamber for recovering the sifted matter, at least one sectioned crushing member, axially mobile and engaged in at least one bore located in said wall of said pressure chamber and which bore opens outwardly from said chamber, said crushing member being adapted to penetrate in the pressure chamber and having means for driving said member in axial translation in two directions said member having a cross section smaller than said pressure chamber with respect to any plane perpendicular to the axis of said crushing member, whereby penetration of said member in the pressure chamber containing the matter to be treated procures both a crushing and compression of said matter,



the withdrawal of the crushing member forming a recess in said mass of matter, compensation means distinct from said crushing member for reducing the volume of the pressure chamber in order to reabsorb the recess remaining in the mass of matter in the pressure chamber after each penetration and withdrawal of said crushing member and means for evacuating the dry residue remaining the pressure chamber after the sifted matter has been extracted.

4,232,601

SQUEEGEE ARRANGEMENT

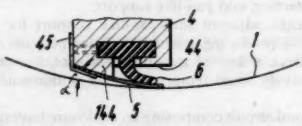
Mathias Mitter, Schloss Holte, Fed. Rep. of Germany, assignor to Mitter & Co., Schloss Holte, Fed. Rep. of Germany

Continuation of Ser. No. 817,106, Jul. 19, 1977, abandoned. This application Jan. 29, 1979, Ser. No. 7,403

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1976, 2632522

Int. Cl.[3] B41F *15/46, 15/42*

U.S. Cl. 101—120 **4 Claims**



1. In a screen printing machine having a printing screen which rotates in a predetermined direction and has an inner surface, a squeegee arrangement comprising a holder spaced from said inner surface and including a face directed towards the same and composed of a substantially horizontal face portion and an inclined face portion which slopes from the level of said horizontal face portion towards said inner surface in said predetermined direction; a squeegee blade of elastically deformable material having a center portion flanked by one longitudinal edge portion which lies on said inclined face portion, and another longitudinal edge portion a margin of which is in sliding engagement with said inner surface of the screen; means fixedly connecting said one longitudinal edge portion to said holder; a solid cross-section spring element of resiliently yieldable material extending along said squeegee blade and having a mounting part secured in said holder and a tongue part projecting outwardly from said horizontal face portion above said center portion of said squeegee blade and having a free edge region engaging said squeegee blade along and in direct contact with said other longitudinal edge portion,

said tongue part being resiliently stressed between said holder and said squeegee blade and deflected in direction away from said inner surface and generally in said predetermined direction towards said holder so that yielding of said squeegee blade in direction away from said inner surface of the screen is a function of the combined resistance offered to such yielding by the deflection of said squeegee blade and the deflection of said tongue part; and variable fluid-pressure means directly above said holder and operative for urging the same towards said inner surface with a variable pressure, so as to permit varying of the combined yielding resistance offered by said squeegee blade and tongue part.

4,232,602

PLATE LOADER FOR OFFSET PRINTING MACHINES

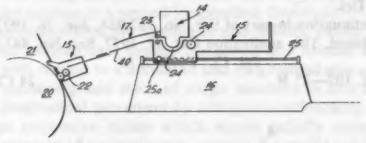
Thomas G. Selman, London, England, assignor to Gestetner Limited, London, England

Filed Jan. 4, 1978, Ser. No. 866,826

Claims priority, application United Kingdom, Jan. 7, 1977, 601/77; Sep. 9, 1977, 37810/77

Int. Cl.³ B41L *11/08*

U.S. Cl. 101—132 **10 Claims**



1. In an offset printing machine including a plate cylinder, and a plate loader which plate loader comprises a plate support; a plate forwarding means for driving said plates from said support along a feed direction; means mounting said support on an offset printing machine; and a drive mechanism for said forwarding means; the improvement wherein said plate loader mounting means include pivot means defining an axis of pivoting of said plate loader with respect to said offset printing machine, said axis being parallel to said plate cylinder, and said drive mechanism includes means automatically engageable to transmit drive upon pivoting of said plate loader into an operative position and automatically disengageable to interrupt drive when said plate support is pivoted from its operative position.

10. In an offset printing machine including a frame; a plate cylinder; a plate loader having stop means to be engaged by the leading edge of a plate to be fed from said loader to said plate cylinder; applicator means for applying plate priming liquid to plates to be printed, said applicator means having a trough for a plate priming solution and a pair of rolls defining a nip through which the wet plate is drawn on its removal from the trough; and first guide means guiding a primed plate from said nip-defining rolls to said stop means; the improvement comprising second guide means slidably supporting said applicator means movably on said frame for movement towards and away from said plate loader, whereby the distance between said nip-defining rolls of the applicator means and said stop means for the leading edge of the plate in the plate loader can be adjusted to be equal to different values of plate length; and means for locking said applicator means in a desired position on said second guide means.

4,232,603

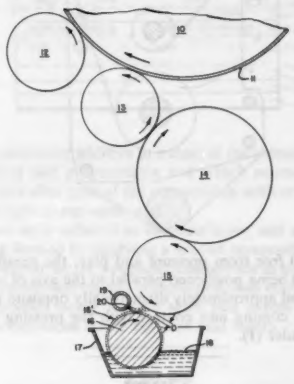
DAMPENING DEVICE FOR OFFSET PRINTING MACHINE

Fahrettin Suvak, New Hyde Park, N.Y., and Robert Snyder, Gilette, N.J., assignors to Wood Industries, Inc., Middlesex, N.J.

Coutinuation of Ser. No. 752,267, Dec. 14, 1976, abandoned, which is a continuation-in-part of Ser. No. 611,262, Sep. 8, 1975, abandoned, which is a continuation-in-part of Ser. No. 407,440, Oct. 18, 1973, abandoned. This application Feb. 16, 1979, Ser. No. 12,709

Int. Cl.³ B41F *7/26, 7/30;* **B41L** *25/06*

U.S. Cl. 101—148 **9 Claims**



1. A dampening device for an offset lithographic printing machine of the type having a fluid fountain for containing a bath of dampening fluid, a pickup roll in said fountain adapted to extend into said bath, a plate cylinder carrying a printing plate, a rotatable fluid distribution means spaced from said pickup roll by a gap and disposed between said pickup roll and said printing cylinder and rotation means for rotating said pickup roll and said distribution means; the improvement comprising in that said pickup roll has a fluid retaining means thereon in the form of a fine wire mesh smooth cylindrical screen on the surface thereof with the wires of the screen comprising thread-like portions forming circumferentially evenly spaced openings where said openings are spaced uniformly radially outwardly from the peripheral surface of the pickup roll for picking up and retaining a thin film of fluid when said pickup roll is rotated in said bath, and in having gaseous blow means the center line of which is directed inwardly toward the peripheral surface of the pickup roll near said gap for breaking up said thin film into droplets and blowing said droplets onto the peripheral surface of the pickup roll where said droplets are atomized into smaller droplets and where said smaller droplets rebound from said surface to pass through said screen to be further atomized to form a fine mist and to move across said gap to the fluid distribution means.

4,232,604

RUBBER BLANKET CLEANING DEVICE

Franz Waizmann, Steppach, Fed. Rep. of Germany, assignor to Firma Baldwin-Gegenheimer GmbH, Augsburg, Fed. Rep. of Germany

Filed Jan. 15, 1979, Ser. No. 3,231

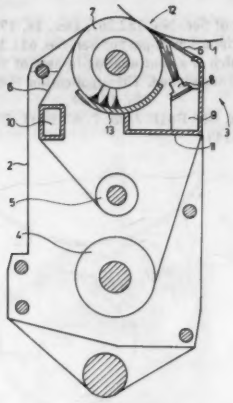
Claims priority, application Fed. Rep. of Germany, Feb. 4, 1978, 2804786

Int. Cl.³ B41F *35/00*

U.S. Cl. 101—425 **4 Claims**

1. Rubber blanket cleaning device for offset printing machines, where a cleaning blanket is passed over a pressing roller and said blanket is brought into contact with the rubber

cylinder to be cleaned by means of said pressing roller, characterized by a pressing roller support (13) at the periphery of the pressing roller (7), whose outer contour can, in non-loaded state, pass by the roller-side surface of said pressing roller



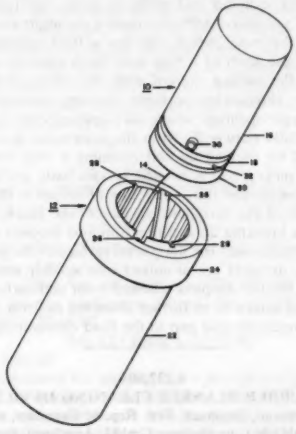
support (13) free from pressure and play, the pressing roller support (13) being positioned parallel to the axis of said pressing roller and approximately diametrically opposite to the arc region (12), coming into contact with the pressing roller, of rubber cylinder (1).

4,232,605

WARHEAD ORIENTATION DEVICE

Clair K. Lair, Upland, Calif., assignor to General Dynamics Corporation Pomona Division, Pomona, Calif.

Filed Jul. 22, 1971, Ser. No. 168,507
Int. Cl.³ F42B *23/24*
U.S. Cl. 102—8 **10 Claims**



1. A directional warhead capable of ejection from a launch tube comprising;

a generally cylindrical body containing an explosive charge in one end thereof;

at least one first guide pin extending outwardly from the cylindrical wall of said body adapted to engage at least one first groove in a warhead launch tube;

a base plate mounted adjacent said body at the end opposite said explosive charge in said body, said base plate provided with an upper face having at least one thrust bearing;

a shaft attached to said base plate;

a stable mass revolubly coupled to said shaft by means permitting free relative rotation between said body and said mass around the axis of said body, said stable mass located adjacent said base plate against the upper face and said at least one thrust bearing of which said mass is forced by acceleration forces during warhead ejection;

at least one second guide pin extending outwardly from said mass adapted to engage at least one second groove in said warhead launch tube;

an electrical power source contained within said body;

arming switch means connected to said power source for arming said warhead, said arming switch means arming detonating means for detonating said explosive charge in said warhead when the warhead has reached a predetermined height above a launch tube after ejection therefrom; and

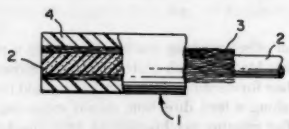
position sensing means connected to said power source for sensing a direction in which to detonate said explosive charge in said ejected warhead.

4,232,606

EXPLOSIVE CONNECTING CORD

Malak E. Yunan, Boonton Township, Morris County, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 762,824, Jan. 26, 1977, abandoned. This application Oct. 17, 1977, Ser. No. 842,096
Int. Cl.³ F42B *3/10*
U.S. Cl. 102—27 R **24 Claims**



1. A low-energy detonating cord adapted for use as a trunkline and/or a downline cord in a non-electric blasting assembly and comprising

(a) an axial continuous solid core of a deformable bonded detonating explosive composition comprising at least about 55 percent by weight of a cap-sensitive crystalline high explosive compound selected from the group consisting of organic polynitrates and polynitramines admixed with a binding agent, the particles of crystalline high explosive compound in said composition having their maximum dimension in the range of about from 0.1 to 50 microns, and the diameter and the explosive content of said core being such as to provide about from 0.1 to 2 grams of crystalline high explosive compound per meter of length of said cord;

(b) surrounding said axial explosive core, protective sheathing consisting solely of one or more layers of plastic material, the plastic material being one which is capable of flowing at a temperature not exceeding the melting point of said crystalline high explosive compound by more than about 75° C.; and

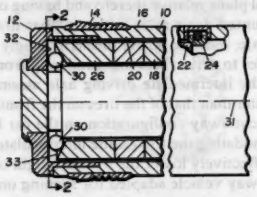
(c) core-reinforcement means outside said core adapted to provide said cord with a tensile strength of at least about 9 kilograms comprising at least one continuous strand of yarn running substantially parallel to said core's longitudinal axis.

4,232,607

CENTRIFUGAL BALL CAM LOCKING DEVICE

Willard R. Benson, Dover, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 1, 1978, Ser. No. 930,083
Int. Cl.³ F42B *11/22*
U.S. Cl. 102—56 R **7 Claims**



1. A centrifugal cam locking apparatus for a spin stabilized projectile comprises:

a cylindrically shaped housing having a longitudinal spin axis and a coaxial housing cavity;

a stack of circularly shaped cargo members contiguously disposed in said housing cavity;

stop means operatively disposed in said housing adapted to engage one end of said stack of cargo members for preventing longitudinal movement of said cargo members in a first longitudinal direction;

base member means fixedly attached to said housing for restraining the other end of said stack of cargo members for moving in a second longitudinal direction;

cam means, slidably disposed in said housing cavity having an inclined cam surface positioned at a critical angle θ with respect to a normal to said longitudinal spin axis, for restraining said stack of cargo members in fore and aft longitudinal movement by acting as a self-locking taper;

spin responsive means which moves radially outward in response to projectile spin, operatively positioned in abutment with said inclined cam surface for exerting a longitudinal force against one end of said stack of cargo members in response to projectile spin and for providing a holding force for substantially eliminating looseness of said stack of cargo members within said housing cavity which causes eratic projectile flight, and, said critical angle of incline θ for said cam means and coefficient of friction "η" for said base member means and said spin responsive means are selected to provide cam back force which increases exponetially with increasing values of coefficient of friction and cam forward forces which decrease exponentially with increasing coefficient of friction.

4,232,608

DIMER ISOCYANATE LINER COMPOSITIONS

John M. Wrightson, Carmichael, Calif., assignor to Aerojet-General Corporation, La Jolla, Calif.

Division of Ser. No. 292,196, Sep. 25, 1972, abandoned. This application Dec. 4, 1978, Ser. No. 965,775
Int. Cl.² F02K *9/04*; C06B *45/10*; F42B *1/00*; B32B *27/40*
U.S. Cl. 102—103 **26 Claims**

1. A method of improving the adherence of a layer of a first composition containing organic active hydrogen compounds to a surface comprising the steps of:

applying to said surface a film of a composition comprising polyurethane forming components having dispersed therein a stable, solid polyisocyanate precursor additive in an amount in excess of the amount necessary to form the polyurethane and which is reactive after cure of the composition with said compounds;

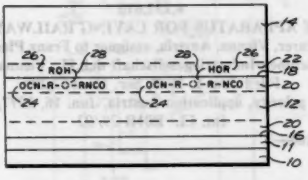
curing said composition to form a polyurethane film containing excess stable, solid polyisocyanate precursor additive;

applying said layer to said film; and

curing said layer and reacting said active hydrogen compounds with said excess additive to form bonds binding said film to said layer.

14. An assembly having improved bonding between layers comprising in combination:

a first layer comprising polyurethane formed by cure of a first composition comprising polyurethane forming components in which is dispersed a stable, solid polyisocya-



nate precursor additive in excess of the amount necessary to form said polyurethane and which excess additive is reactive after cure of the composition with organic active hydrogen compounds; and

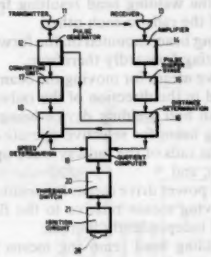
a second layer adhered to said first layer, said second layer being formed by applying a second composition containing organic active hydrogen compounds to said first layer and curing said second composition, said active hydrogen compounds being reacted with said excess additive to form interfacial bonds between said layers.

4,232,609

PROXIMITY FUSE

Manfred Held, Kühbach, Fed. Rep. of Germany, assignor to Messerschmitt-Bölkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed Sep. 12, 1974, Ser. No. 506,328
Claims priority, application Fed. Rep. of Germany, Sep. 20, 1973, 2347374
Int. Cl.³ F42C *13/04*
U.S. Cl. 102—214 **6 Claims**



1. A missile to be directed toward a target, comprising a warhead to release target destroying bodies into the path of the target, a proximity fuse coupled to the warhead and including transmitting-receiving means for transmitting electromagnetic waves toward a target and for receiving reflected electromagnetic waves from the target, said fuse including a circuit coupled to said transmitting-receiving means and responsive to said electromagnetic waves for producing an ignition signal to start the decomposition of the warhead when a distance is reached between the warhead and a target, said circuit having means for determining the time t_A which will elapse before the warhead encounters the target, said circuit having means for storing a constant reference time t_B so that when the warhead decomposes the bodies are released within a certain space

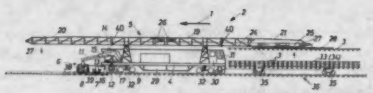
sector and cover a given space in front of the target within the reference time and for comparing the determined time t_A with the constant reference time t_B, said means for storing and comparing including a threshold device set to have a threshold corresponding to the time t_B, and means responsive to said means for storing and comparing for generating the ignition signal for starting the decomposition of the warhead on the strength of this comparison as soon as the determined time becomes shorter than the reference time.

4,232,610

MOBILE APPARATUS FOR LAYING RAILWAY TRACK

Josef Theurer, Vienna, Austria, assignor to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria

Filed Jun. 5, 1978, Ser. No. 912,299
Claims priority, application Austria, Jun. 16, 1977, 4282/77
Int. Cl.³ E01B *29/02*
U.S. Cl. 104—3 **5 Claims**



1. A mobile apparatus for laying railway track including rails fastened to ties defining cribs therebetween, which comprises

(a) a car mounted for mobility on the rails of the railway track in an operating direction, the car having a forward end,

(b) a carrier frame having

(1) a track and

(2) a power-driven trolley mounted on the carrier frame track, the trolley including a beam for carrying and laying an assembled section of the railway track including rails fastened to ties,

(c) a vertically and transversely adjustable flash butt welding device below the carrier frame and in the region of the forward end of the car for welding the rails of the assembled railway track section laid by the beam to the rails of the railway track whereon the car is mounted,

(d) means associated with the flash butt welding device for removing the welding bead resulting from the flash butt welding of the rails to each other,

(e) an overhang beam mounted on the forward end of the car and projecting forwardly therefrom,

(f) power drive means for moving the beam vertically, transversely and in the direction of the railway track,

(1) the flash butt welding device being mounted on the overhang beam for selective operation in the range of one of the rails of the railway track upon movement of the beam, and

(g) additional power drive means for positioning the welding bead removing means relative to the flash butt welding device and independently thereof,

(1) the welding bead removing means including a bead removing device associated with each of the rails.

4,232,611

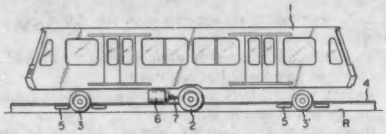
GUIDED VEHICLE FOR GUIDE-WAY TRANSPORTATION SYSTEM

Yukio Uozumi, Kobe, Japan, assignor to Kawasaki Jukogyo Kabushiki Kaisha, Hygo, Japan

Filed May 19, 1977, Ser. No. 798,669
Claims priority, application Japan, May 21, 1976, 51-58672
Int. Cl.³ B61B *13/04*; B61F *9/00*; B62D *11/00*
U.S. Cl. 105—215 R **7 Claims**

1. A guide way vehicle adapted for running on guide way means having running surface means and guide rail means disposed on the running surface means, wherein the vehicle comprises a rigid unitary car body having three axle assemblies mounted respectively at the front, rear, and intermediate portions thereof, each axle assembly having wheels with rubber tires attached to the opposite ends thereof; the axle assemblies at the front and rear portions of the car body being pivotally mounted to swivel about a substantially vertical axis and respectively having guide wheels mounted for running along said guide rail means whereby the axle assemblies are steered along the guide rail means; the intermediate driving axle assembly being secured to the car body to prevent its swivel motion in a horizontal plane relative thereto and having oppositely and coaxially mounted drive axles with a rubber tire at the outer end of each axle; separate power means drivingly connected to said drive axles to drive them independently from each other; the tires on the intermediate driving axle assembly having a diameter greater than that of the tires on the front and rear axle assemblies; a cut-away configuration on the car body for partially accommodating the tire on the intermediate driving axle assembly to effectively lower the overall height of the vehicle.

7. A guide way vehicle adapted for running on a guide way



having a horizontal running surface and a central vertically extending guide rail, said vehicle comprising:

(a) a car body of rigid unitary construction having front, rear and intermediate axle assemblies, each assembly having wheels with attached rubber tires at the distal ends thereof to contact said horizontal running surface on opposite sides of said car body;

(b) the front and rear axle assemblies being mounted to swivel in a horizontal plane relative to the car body, each assembly having guide wheels mounted to contact said guide rail to steer the assembly along the guide rail;

(c) the intermediate axle assembly being secured to the car body to prevent its swivel motion in a horizontal plane, said intermediate assembly having driving power means coupled thereto for rotating the tires thereof independently of each other to propel the vehicle along the guide way; and

(d) said car body having a cut-away configuration over the central driving axle for partially accommodating the tires thereof.

4,232,612

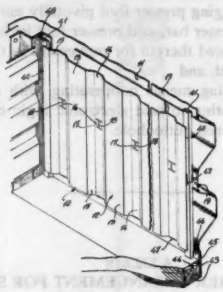
WALL LINING WITH ATTACHMENT MEANS

Robert B. Winsor, Beaconsfield, Canada, assignor to IEC-Holden Ltd., Montreal, Canada

Filed Feb. 22, 1978, Ser. No. 880,126
Int. Cl.³ B61D *17/18*
U.S. Cl. 105—423 **9 Claims**

1. A wall lining sheet comprising a rigid sheet having a plurality of spaced-apart bendable attachment tabs disposed in the plane of said sheet and each defined by a configured slot extending through said sheet, said sheet being free of support adjacent said tabs and each said tabs having a bendable free end portion and transverse opposed side edges free of said sheet whereby said bendable free end portion may be displaced outwardly from the plane of said sheet without deforming said sheet for securement of said sheet to a backing structure having

an irregular outer plane, said securement being effected by a weld formed between said tabs and said outer plane through an



opening formed by said configured slot after deformation of said tabs to an adjacent portion of said irregular plane.

4,232,613

ARMOR PLATED SAFE

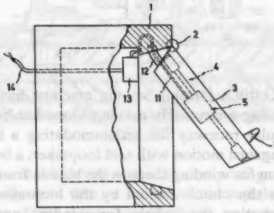
Alfons Kempf, Nikolsburger Strasse, D-8950 Kaufbeuren, Fed. Rep. of Germany, assignor to Adolf Frentrup, Kleve-Bedburg and Alfons Kempf, Kaufbeuren, both of, Fed. Rep. of Germany

Filed Feb. 6, 1979, Ser. No. 9,836

Claims priority, application Fed. Rep. of Germany, Feb. 10, 1978, 2805668

Int. Cl.[2] **E05G** *1/04, 1/10*

U.S. Cl. 109—40 **10 Claims**



1. A safe comprising an armor plated housing, a hinged armor plate door for closing said housing, a locking mechanism arranged within said door and electric driving means for operating the locking mechanism, said driving means being arranged within said door, a program controlled time switch arrangement within said housing, an adjustment device for programming said time switch; said program controlled time switch and said adjustment device being not accessible from outside of the safe, an electric connection between said time switch and said driving means and a power supply electrically connected with said time switch and said driving means.

4,232,614

PROCESS OF INCINERATION WITH PREDRYING OF MOIST FEED USING HOT INERT PARTICULATES

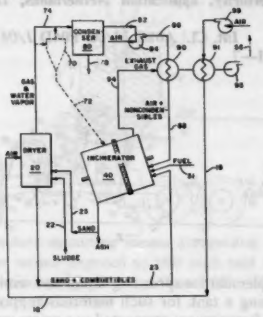
Elliot B. Fitch, Auburn, Ala., and Orris E. Albertson, Salt Lake City, Utah, assignors to Dorr-Oliver Incorporated, Stamford, Conn.

Continuation-in-part of Ser. No. 856,379, Dec. 1, 1977, Pat. No. 4,159,682. This application Jun. 6, 1979, Ser. No. 46,392

Int. Cl.[3] **F23G** *5/04*

U.S. Cl. 110—235 **4 Claims**

1. A process for combustion of moist combustible feed wherein said moist feed is first dried and then introduced into a combustion zone containing inert, particulate material comprising, withdrawing a quantity of hot, inert, particulate material from said combustion zone, intimately contacting said moist feed with said hot particulate material in a drying zone to evaporate the water in the feed at a relatively low temperature, removing water vapor and non-condensible gas from said drying zone in a gas stream, removing the dried solids from



said drying zone and charging said dried solids into said combustion zone for combustion, treating said gas stream to remove and dispose of the water vapor therein, forwarding the balance of the gas stream to the combustion zone for deodorizing by heating to elevated temperature and exhausting the gases from said combustion zone to the atmosphere with or without further treatment.

4,232,615

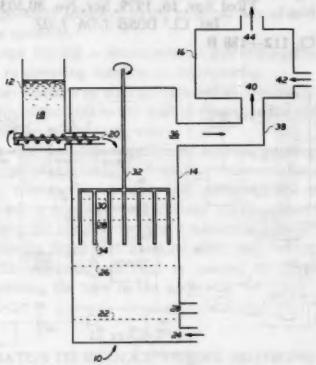
COAL BURNING METHOD TO REDUCE PARTICULATE AND SULFUR EMISSIONS

Melvin H. Brown, Freeport, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Jun. 11, 1979, Ser. No. 47,004

Int. Cl.[3] **F23K** *1/02;* **F23N** *3/00*

U.S. Cl. 110—342 **13 Claims**

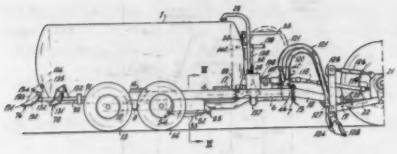


1. A method for burning a pulverized carbonaceous material containing sulfur and ash, comprising forming a slurry containing the carbonaceous material, water and a reagent adapted to react with the sulfur, burning the slurry in a first stage with less than 100% theoretical air, removing the combustible gases from the first stage to a second stage, and burning the gases in the second stage with additional air.

4,232,616
DEVICE FOR SELECTIVELY APPLYING LIQUID MANURE ONTO OR INTO THE GROUND

Cornelis van der Lely, 7, Brüschenrain, Zug, Switzerland

Continuation of Ser. No. 752,864, Dec. 21, 1976, abandoned.
This application Aug. 14, 1978, Ser. No. 933,481
Claims priority, application Netherlands, Dec. 22, 1975, 7514909
Int. Cl.³ A01C 23/00; F04D 1/04
U.S. Cl. 111—7 84 Claims

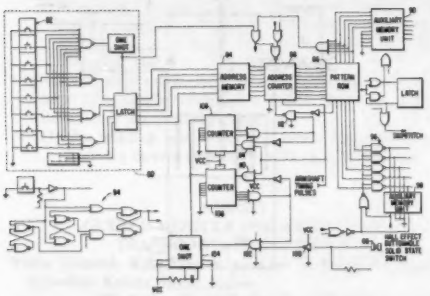


1. An implement for spreading liquid and semi-liquid materials comprising a tank for such materials supported on frame means, said frame means connected to a prime mover, said tank being in communication with material delivery means, said delivery means comprising at least one outlet port and means comprising at least one flexible delivery hose at each opposite side of said tank and driven means in communication with the interior of said tank to deliver material to each said hose, a corresponding pipe extending from the front to the rear of said tank with respect to the normal direction of forward travel of the implement, the rear ends of said pipes having outlet ports with spreading members including means for spreading material outwardly and rearwardly relative to said tank, a soil cultivator being positioned in front of said tank and interconnected to said prime mover, said cultivator having material injectors that extend into the ground, said hoses being alternatively connectable to said injectors and to said pipes, whereby material is adapted to be delivered into and onto the ground respectively.

4,232,617
ONE-STEP BUTTONHOLER WITH HALL EFFECT SENSOR

Stephen A. Garron, Elizabeth, N.J., assignor to The Singer Company, Stamford, Conn.

Filed Apr. 16, 1979, Ser. No. 30,503
Int. Cl.³ D05B 3/06, 3/02
U.S. Cl. 112—158 B 4 Claims



1. In a zigzag sewing machine having stitch forming instrumentalitites including a reversible incremental feed mechanism and a reciprocatory needle bar arranged for lateral jogging motion, electro-magnetic actuation means for controlling various of the stitch forming instrumentalities and electronic logic circuitry for the activation of said actuation means and for the storing of various stitch patterns inclusive of a buttonhole pattern, means for determining the size of a buttonhole being sewn comprising:

a downwardly biased presser bar;

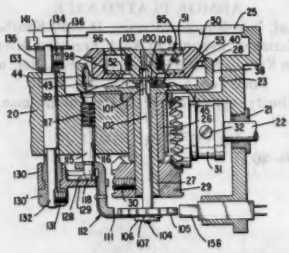
a buttonhole gauging presser foot pivotally mounted to the end of said presser bar, said presser foot including a shoe shiftably mounted thereto for movement in the direction of material feed; and

magnetic indicating means cooperating with said presser foot for indicating to said electronic logic circuitry the size of the desired buttonhole.

4,232,618
BOBBIN WINDER ARRANGEMENT FOR SEWING MACHINE LOOPTAKER

Stanley J. Ketterer, Jamesburg, N.J., assignor to The Singer Company, Stamford, Conn.

Filed Jul. 16, 1979, Ser. No. 58,232
Int. Cl.³ D05B 57/08, 59/00
U.S. Cl. 112—184 3 Claims



1. In a lockstitch forming sewing machine having a looptaker comprising a circularly moving looptaker body formed with an annular raceway for accommodating a bobbin case constrained against motion with said looptaker, a bobbin winding mechanism for winding thereon the bobbin from the needle comprising a slip clutch carried by the looptaker body and means for rotating the bobbin for winding needle thread thereon comprising an elevatable spindle passable through said slip clutch and engageable with the bobbin for rotating the bobbin for rotation with said looptaker body while said slip clutch enables cessation of bobbin rotation when the bobbin is full and bobbin thread winding is no longer required.

4,232,619
LIFTING LOOP

Bengt E. Lindahl, Gothenburg, Sweden, assignor to Svensk Lasthantering, Bengt Lindahl AB, Torslanda, Sweden

Filed Apr. 25, 1978, Ser. No. 899,734
Int. Cl.³ D05B 93/00
U.S. Cl. 112—417 2 Claims

1. An improved flexible lifting loop of sufficient length to encircle and support a large lifting load comprising a core of parallel threads, a protecting covering enclosing said core and retained about said core by a seam extending in the longitudinal direction of the loop, the improvement comprising said seam being a side seam, said threads and said covering having sufficient flexibility to conform to the shape of a lifting hook or the like and the engaged portion of the lifted load, said seam

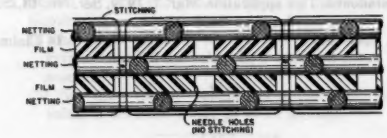
when stitching together said protecting covering making said covering enclose said core snugly and retain said threads in their parallel relationship when said loop is engaged with a load.

4,232,620

THERMAL INSULATING MATERIAL

Milton Kurz, Pond Crossing, Lawrence, N.Y. 11559

Filed Oct. 16, 1978, Ser. No. 951,371
Int. Cl.³ B32B *3/10, 7/08*
U.S. Cl. 112—420 **1 Claim**



1. A thermal insulating material comprising at least two sheets of polymeric film, a mesh sandwiched between each adjacent pair of film sheets, an outer mesh on each outside face of the film-mesh sandwich, rows of stitching joining the outer meshes and film-mesh sandwich and needle perforations through the film sheets to make the material vapor permeable including both perforations made by the needles which stitch the outer meshes and film-mesh sandwich together which are of a size of from about four to about seven diameters of the stitching thread and additional perforations made by non-threaded needles.

4,232,621

METAL-WORKING HAND TOOL

John H. Keeton, P.O. Box 278, Campbellsville, Ky. 42718

Filed Feb. 6, 1978, Ser. No. 875,544
Int. Cl.² B21D *19/00*
U.S. Cl. 113—54 R **10 Claims**

1. A metal-working hand tool for folding over sheet metal flanges, comprising

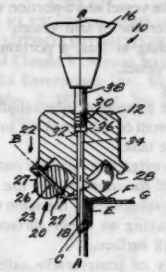
a body adapted to rotate about a first axis of rotation,

means for attaching said body to a power source for rotating said body about the first axis of rotation,

a guide component extending outwardly from one end of said body generally along the first axis of rotation,

a plurality of hardened metal roller means, and

means for mounting said roller means to said body for free rotation about second axes, fixed with respect to said body, so that said roller means will impact upon and roll with respect to a sheet metal flange or the like,



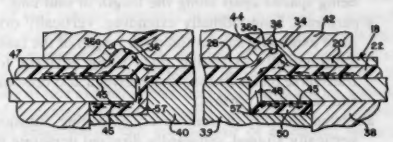
said roller means mounting means comprising a shaft for each roller means disposed so that each said second axis makes a positive angle between 0° and 90° with respect to said first axis of rotation.

4,232,622

METHOD OF MAKING A CONTAINER CLOSURE

Robert J. Weierman, Lockport; Joseph J. Merle, Oak Lawn; Gerald A. Gordon, Skokie; Peter N. Y. Pan, Country Club Hills, and Rafael J. Hernandez, Chicago, all of Ill., assignors to The Continental Group, Inc., Stamford, Conn.

Division of Ser. No. 950,483, Oct. 11, 1978, Pat. No. 4,170,314.
This application Jan. 23, 1979, Ser. No. 5,755
Int. Cl.³ B21D *51/46*
U.S. Cl. 113—121 C **7 Claims**



1. A method of forming a closure on a container wall having an external side and having a pour opening comprising:

applying a peelable adhesive to the external side of said wall about the opening,

placing a tape having a thermoplastic portion against the adhesive in covering relation to the opening,

heating either the tape or wall or both before, during or after application of the tape to the wall to plasticize the thermoplastic portion of the tape, and

pressing the wall and tape together to squeeze excess plasticized thermoplastic material from therebetween, by a tool having a rib-forming groove and directing the excess material into a confined area defined by the groove circumscribing the opening to form a reinforcing rib projecting outwardly from said external side, into which said excess thermoplastic material is caused to flow and thereby sealing the tape to the wall.

4,232,623

APPARATUS TO REDUCE VESSEL MOTIONS

Frank S. F. Chou; David P. Tuturea, and Graham J. Blight, all of Houston, Tex., assignors to Brown & Root, Inc., Houston, Tex.

Filed Nov. 25, 1977, Ser. No. 854,652
Int. Cl.³ B63B *39/03*
U.S. Cl. 114—125 **14 Claims**

1. Apparatus for reducing the relative motions of a floating vessel comprising

at least a pair of open tanks, one tank on the starboard side of said vessel and one tank on the port side of said vessel,

each tank having a portion which extends above a means water line of the vessel and a portion which extends below the means water line of said vessel,

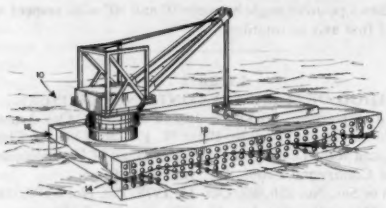
each tank extending at least a portion of the longitudinal length of said vessel,

each tank having

a bottom plate extending substantially laterally outward from the bottom of the vessel for substantially the entire length of the tank,

a deck portion extending laterally outward from the deck of said vessel for substantially the entire length of the tank, having substantially the same width as said bottom plate, and having an upper surface substantially flush with the deck surface;

a first plurality of transversely extending, substantially vertically aligned perforate plates, each transverse plate structurally connected between said vessel, said bottom



plate, and said deck portion, and said transverse plates being spaced apart along the length of said tank,

a perforate, longitudinally extending, vertically oriented plate extending substantially the length of the tank, said longitudinally extending plate being adjacent to said transverse plates and secured between said bottom plate and said deck portion,

a second plurality of transversely extending, substantially vertically aligned, outwardly directed perforate plates, each second plate structurally connected between said longitudinally extending plate, said bottom plate, and said deck portion, and said plates being spaced apart along the length of said tank, and

a second perforate, longitudinally extending vertically oriented plate extending substantially the length of the tank and connected between outward edge portions of said bottom plate and said deck portion,

whereby an array of longitudinally and laterally spaced, wave energy dissipating cells are formed, each cell having at least two perforate side walls.

4,232,624

RESERVOIR STRUCTURE

Johannes Wipkink, Sassenheim, Netherlands, assignor to Ingenieursbureau Marcon (Marine Consultants) B.V., Leiden, Netherlands

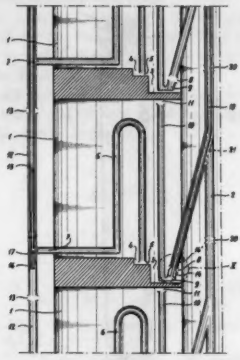
Filed May 25, 1978, Ser. No. 909,430

Claims priority, application Netherlands, May 26, 1977, 7705823

Int. Cl.[3] B65D *88/54*

U.S. Cl. 114—257 **9 Claims**

1. A fluid storage structure having a reservoir for containing a liquid, including means for introducing a pressurized gas into the reservoir to drive liquid from the reservoir, characterized by: the means for introducing gas into the reservoir including a gas supply duct having two openings, one near the bottom of the reservoir and one near the top, and selectively displaceable switching means for controlling the flow of gas through the openings of the supply duct, said switching means having a



first position in which both openings are open and a second position in which only the top opening is open.

4,232,625

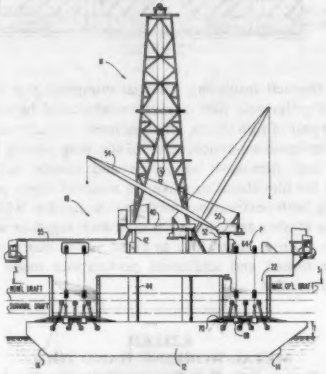
COLUMN STABILIZED SEMISUBMERGED DRILLING VESSEL

Yoram Goren, Los Angeles, and Charles Springett, Irvine, both of Calif., assignors to Sante Fe International Corporation, Orange, Calif.

Continuation of Ser. No. 868,485, Jan. 11, 1978, abandoned, which is a continuation of Ser. No. 699,789, Jun. 25, 1976, abandoned, which is a continuation of Ser. No. 596,256, Jul. 16, 1975, abandoned. This application Mar. 7, 1979, Ser. No. 18,253

Int. Cl.[3] B63B *35/44*

U.S. Cl. 114—264 **14 Claims**



1. A column stabilized semisubmersible vessel consisting of a pair of elongated hulls disposed in substantiallyparallel spaced side-by-side relation with each of said hulls spaced from and lying on an opposite side of the longitudinal centerline of said vessel, said vessel further comprising:

a working platform spaced above said hulls a predetermined height;

means for supporting said platform in fixed spaced relation above said hulls, including four stabilizing columns connecting said hulls with said platform;

the ratio of the length of said vessel along its longitudinal centerline to the width of said vessel along its transverse centerline being greater than 1.0;

one pair only of said stabilizing columns being connected with each of said hulls on opposite sides of the vessel roll axis, with one column of each said pair being located near respective opposite ends of each hull on opposite sides of the pitch axis of the vessel;

means for ballasting said vessel including ballast compartments in said hulls, to alter the vessel's draft between a low draft hull-supported floating condition with the hulls having freeboard and a high draft semisubmerged column stabilized floating and operating condition with mean water-line located intermediate the height of said columns;

said columns being of cross-sectional areas and location so as to provide a ratio of righting moment about the vessel's transverse pitch axis to righting moment about the vessel's longitudinal roll axis within a range of 1.0 to 1.3 when said vessel is in high draft semisubmerged operating condition;

each of said hulls for at least substantially the major portion of its length being of substantially oblong cross-section and having top and bottom substantially parallel substantially planar surfaces, with breadth of each hull cross-section in direction of the vessel's transverse axis being greater than vertical height of each hull section;

the width of the vessel at the hulls in relation to the transverse spacing between the hulls being within a range of 1.5:1 to 2:1;

a plurality of longitudinally spaced structural means reinforcing the structural relationship of the hulls, platform and columns; and

said vessel comprising means including said columns of predetermined cross-sectional area, said transverse spacing of the hulls one from the other, vessel displacement, and geometry of the submerged portions of the vessel in high draft column stabilized semisubmerged operating condition being such as to provide a vessel heave response curve having a "low wave period section", a "first hump", and a "third section" with an "RAO" in relation to wave period "T" according to the following mathematical relationships:

(i) the RAO value of the curve's "first hump" is not greater than 0.6 for values of T between about 10 to 14 seconds;

(ii) the "third section" of the curve has a natural period value of between about 16 to 18 seconds.

4,232,626

DEVICE FOR CONTROLLING THE ORIENTATION OF A BOAT IN WATER

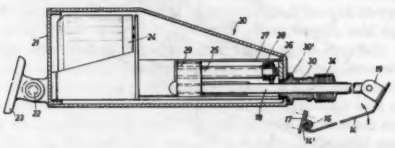
Klaus Kern, Ennepetal, Fed. Rep. of Germany, assignor to Firma K & S Baubeschlage Hugo Kruger KG, Gevelsberg, Fed. Rep. of Germany

Filed Sep. 15, 1978, Ser. No. 942,623

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1977, 2743154

Int. Cl.³ B63B *1/22*

U.S. Cl. 114—285 **8 Claims**



8. For use on a boat, a trimming flap moving means comprising a watertight housing, a remotely controllable low voltage drive motor fixed to said housing on the inside thereof, a drive screw rotatably mounted in said housing and operatively connected to the motor a nut non-rotatably mounted on said drive screw for movement longitudinally of said screw on rotation thereof, and an adjusting rod extending parallel to said screw in a watertight manner through a wall of said housing and having the end thereof within said housing connected to said nut.

4,232,627

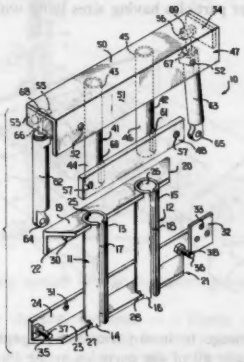
BRACKET FOR ELEVATING AND LOWERING AN OUTBOARD MOTOR

Ronnie D. Glenn, and Claude V. Myers, both of Eldorado, Ark., assignors to G & M Enterprises, Inc., El Dorado, Ark.

Filed Mar. 2, 1979, Ser. No. 17,058

Int. Cl.³ B63H *5/12*

U.S. Cl. 440—61 **10 Claims**



1. A bracket for elevating and lowering an outboard motor relative to the transom of an associated boat comprising a first pair of generally elongated tubular elements disposed with their axes in generally parallel relationship, an elongated slot in each of said tubular elements likewise disposed in generally parallel relationship, a first pair of spaced generally parallel transom mounting members secured at axially opposite end portions of said tubular elements, means for facilitating the securing of said mounting members to a boat transom, a second pair of elongated elements disposed with their axes in generally parallel relationship, said second pair of elongated elements being disposed in internal telescopic sliding relationship relative to said first pair of tubular elements, a second pair of spaced generally parallel motor mounting members secured at axially opposite end portions of said second pair of elements, means for facilitating the securing of said second pair of mounting members to an outboard motor, power means between said first and second pair of mounting members for imparting relative telescopic motion between said first and second pair of elements, and means between at least one of said second pair of elements and the slot associated therewith for guiding the relative sliding movement of said first and second pair of elements.

4,232,628

TONER APPLICATOR FOR ELECTROSTATIC COPIER

Loren E. Shelffo, South Orange, N.J., assignor to Eskofot Research A/S, Copenhagen, Denmark

Continuation of Ser. No. 595,896, Jul. 15, 1975, abandoned. This application Nov. 10, 1976, Ser. No. 740,662

Int. Cl.³ G03G *15/08*

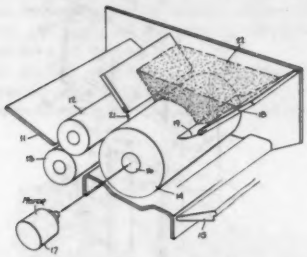
U.S. Cl. 118—653 **5 Claims**

1. An applicator adapted to deposit triboelectrically-charged toner particles on an electrostatically charged latent image formed on a photo-conductive insulating moving medium in a xerographic system, said applicator comprising:

A. a rotatable roll formed of conductive elastomeric material and mounted on electrically-insulated bearings so that a bias may be applied thereto;

B. a trough for retaining a supply of non-magnetic toner

particles, said trough being defined by two spaced plates associated with the surface of the roll, one plate having a deflectable blade extending therefrom formed of dielectric material, the edge of the blade being pressed tangentically against the moving roll surface and being somewhat deflected thereby against the roll surface to form a tight nip therewith which only admits a thin layer of said particles drawn from the bottom of the trough, the particles admitted through said nip rubbing against said edge and being triboelectrically charged thereby, whereby the layer carried on the roll surface departing from the nip is constituted by charged toner particles which adhere to the roll, said toner particles having sizes lying within a relatively



narrow range to insure frictional engagement between substantially all of the particles in the thin layer thereof and said blade edge;

C. means bringing about engagement between the charged layer of toner particles on the roll surface and said moving medium at a position displaced from the nip to effect a transfer of particles to said latent image on said medium to produce a developed image thereon;

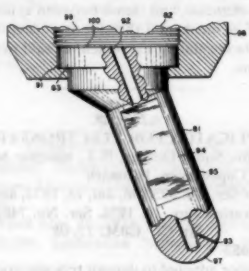
D. means to rotate said roll at a speed producing relative motion between the surface thereof and the medium to develop shear forces therebetween to enhance the deposition of charged toner particles on the latent image to produce an improved developed image.

4,232,629

DISPENSING NOZZLE

William R. Eddy, Kansas City, Mo., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 13, 1978, Ser. No. 924,427
Int. Cl.[3] B05C *5/02, 7/02*
U.S. Cl. 118—669 **16 Claims**



1. A nozzle for dispensing a ribbon of viscous liquid, said nozzle including:

a body having a first portion adapted for being secured to a source of liquid and a second portion extending from said first portion with said second portion having an exterior surface and a free end;

first means defining a first passage extending at least partially through said second portion; and

second means defining a second passage opening onto said second portion exterior surface, said second passage being in flow communication with the first passage, said second means including a pair of spaced apart generally parallel first surfaces partially defining the second passage with a width greater than the spacing between the pair of first surfaces, said second passage being generally rectangularly shaped in transverse section.

9. An apparatus for applying sealant to a seam in a container sidewall formed by overlapping portions of the sidewall, said apparatus including:

conveying means operable for moving a container to and away from a first sealing station;

first detecting means positioned adjacent to a portion of said conveying means and being operable for detecting the rotational position of a container sidewall;

first drive means positioned adjacent said first detecting means and being operable for selectively rotating a container to a predetermined rotational position; and

first sealant dispensing means positioned adjacent said conveying means at the first sealing station and being operable for dispensing sealant onto at least a portion of said seam, said first sealant dispensing means cooperating with means for providing relative movement between a portion of the first sealant dispensing means and the container, said first sealant dispensing means including a nozzle for dispensing a ribbon of viscous liquid said nozzle including

a body having a first portion adapted for being secured to a source of liquid and a second portion extending from said first portion with said second portion having an exterior surface and a free end;

first means defining a first passage extending at least partially through said second portion; and

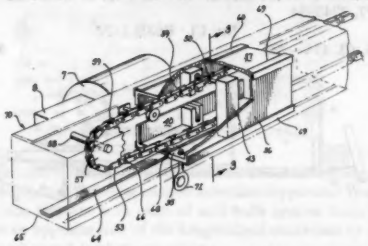
second means defining a second passage opening onto said second portion exterior surface, said second passage being in flow communication with the first passage, said second means including a pair of spaced apart generally parallel first surfaces partially defining the second passage with a width greater than the spacing between the pair of first surfaces said second passage being generally rectangularly shaped in transverse section.

4,232,630

ANIMAL EXERCISER

Gerald J. Orlowski, Scottsdale, Ariz., and Thomas E. Dugle, Cincinnati, Ohio, assignors to Fun-Tech Products Company, Phoenix, Ariz.

Filed Feb. 2, 1979, Ser. No. 9,375
Int. Cl.[3] A01K *15/00*
U.S. Cl. 119—29 **9 Claims**



1. Apparatus for exercising and training animals comprising:

(a) a carriage;

(b) means for attaching an animal to said carriage;

(c) transportation means for supporting and reciprocally moving said carriage along a substantially straight line of travel comprising:

(1) an endless belt having first and second courses travelling in opposite directions;

(2) means for moving said belt along the line of travel;

(3) means for moving and reversing the direction of travel of said carriage responsive to the movement of said belt comprising a connecting member having a first part engaging said carriage and a second part engaging an anchor point on said endless belt, said first part adapted to move from a first carriage engaging position to a second carriage engaging position responsive to the movement of said anchor point between said first and second courses; and

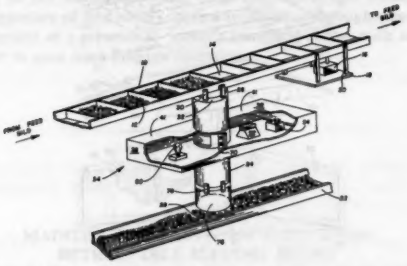
(d) means for supporting said transportation means and carriage.

4,232,631

FEEDER DEVICE

Edward F. Smith, Sr., R.R. #2, and Lloyd N. Treesh, P.O. Box 546, Avilla, both of Ind. 46710

Filed Jan. 5, 1978, Ser. No. 867,106
Int. Cl.³ A01K *5/02*
U.S. Cl. 119—52 AF **8 Claims**



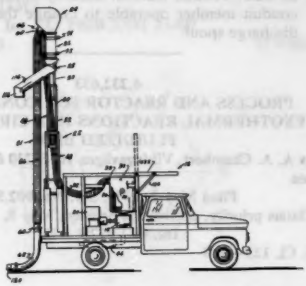
1. An apparatus for distributing measured amounts of particulate material comprising a conveyor, said conveyor having a material-moving mechanism and a discharge outlet, a material receptacle positioned below said conveyor discharge outlet, said material receptacle having a bottom, a conduit being mounted between said conveyor outlet and said receptacle bottom, said conduit having opposite open ends, one of said conduit ends being in communication with said conveyor outlet, the other of said conduit ends being in communication with said receptacle, said conveyor having means for driving said mechanism with an on condition in which said particulate material is caused to flow into said one conduit end and through said conduit and into said receptable, said other conduit end being spaced from said receptacle bottom a distance by which said particulate material flow first fills said receptacle to a desired level and then fills said conduit, a material monitor including a signal sender and a signal receiver, said signal sender and signal receiver being selectively mounted on opposite sides of said conduit at a predetermined height, said signal sender directing a signal toward said signal receiver and through said conduit and said particulate material flow when said driving means is in said on condition, said conduit being of a material which allows said signal to pass through said conduit, said signal being uninterrupted by said particulate material flowing through said conduit, whereby said signal sender and signal receiver are in signal communication, said signal being blocked when said conduit is filled with said particulate material above said predetermined height, said driving means having an off condition in which no particulate material is caused to flow into said one conduit end, said signal receiver being operatively connected to said driving means, said driving means being in said on condition when said signal sender and signal receiver are in signal communication, said driving means being in said off condition when said signal is blocked.

4,232,632

LIVE FOWL CONVEYING SYSTEM

Jack W. Kice, Wichita, Kans., assignor to K-B Engineering Co., Wichita, Kans.

Continuation of Ser. No. 645,527, Dec. 29, 1975, abandoned, which is a continuation of Ser. No. 70,011, Sep. 8, 1970, abandoned. This application Oct. 4, 1976, Ser. No. 729,380
Int. Cl.³ A01K *29/00*
U.S. Cl. 119—82 **18 Claims**



1. A conveying system for the transport of live fowl comprising:

(a) a receiver chamber mounted on a frame, said receiver chamber including a housing having a fowl inlet and a fowl outlet for live fowl, a pressure differential outlet for air generally positioned laterally with respect to said fowl inlet for inhibiting additional forward progression of said live fowl from said fowl inlet, and a partition for cushioning and directing said live fowl towards said fowl outlet comprising a plurality of resilient cylindrical bumper members transversely attached within said housing to allow the passage of said air therebetween and to essentially enclose said fowl inlet and said fowl outlet and separate same from said pressure differential outlet while said air is being passed thereto;

(b) an airlock connected to said receiver outlet, said airlock comprising a housing including a fowl discharge outlet and at least two door members opening sequentially during conveyance of said live fowl through said airlock;

(c) a fowl conduit having an inlet for said live fowl and an outlet attached to said fowl inlet of said receiver chamber; and

(d) means connected to said receiver chamber for creating a pressure differential between said fowl conduit inlet and said receiver chamber in order to move said live fowl to said receiver chamber for discharge through said door members of said airlock.

10. A conveying system for the transport of live fowl comprising:

(a) a receiver chamber mounted on a frame, said receiver chamber including a housing having a fowl inlet and a fowl outlet for live fowl, means situated within said receiver chamber for cushioning and directing said live fowl towards said fowl outlet;

(b) an airlock connected to said receiver outlet, said airlock comprising a housing including a fowl discharge outlet and at least two door members opening sequentially during conveyance of said live fowl through said airlock;

(c) a fowl conduit having an inlet for said live fowl and an outlet attached to said fowl inlet of said receiver chamber;

(d) means connected to said receiver chamber for creating a pressure differential between said fowl conduit inlet and said receiver chamber in order to move said live fowl to said receiver chamber for discharge through said door members of said airlock; and

(e) means for discharging said live fowl from said airlock comprising a discharge conduit having an upper portion

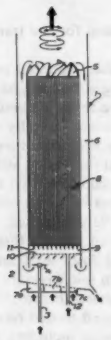
and a lower portion, said upper portion including a structure defining a venturi, an upper swivel joint rotatably connected to said airlock, an auxiliary air inlet connected to said means for creating a pressure differential and situated between said venturi and said upper swivel joint, said lower portion including a structure defining a lower swivel joint connected to the lower end portion of said venturi, a flexible conduit member connected to said lower swivel joint, and a lengthwise adjustable discharge spout attached to said flexible conduit, said spout having an outer conduit member slidably mounted on an inner conduit member operable to change the length of said discharge spout.

4,232,633

PROCESS AND REACTOR FOR CONDUCTING EXOTHERMAL REACTIONS IN A CIRCULATING FLUIDIZED BED

Lars A. A. Chambert, Vikingavägen 16, S-230 50 Bjärred, Sweden

Filed May 3, 1978, Ser. No. 902,533
Claims priority, application Sweden, May 9, 1977, 7705352
Int. Cl.³ F22B *1/02*
U.S. Cl. 122—4 D **13 Claims**



1. A reactor for conducting exothermal reactions such as combustion, said reactor having lower supply means for supplying relatively heavy phase and a further supply means for supplying relatively light fluidization phase, upper separarting means for separating said phases from one another, return passages for separated heavy phase to the bottom section of the reactor or a region immediately above said bottom section, outlets from the reactor for the relatively heavy and relatively light phases, and cooling surfaces in said reactor, wherein the supply means for said relatively light phase include outlet openings located in the reactor spaced from and facing the reactor side walls and said outlet openings are adjustable in the height direction of the reactor.

4,232,634

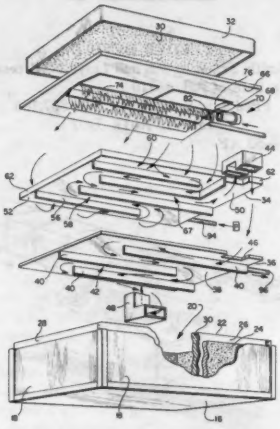
HIGH EFFICIENCY HOT WATER BOILER

George C. Terrell, Foxboro, and Andrew Konnerth, III, Swansea, both of Mass., assignors to Conservation Technologies, Inc., Bristol, R.I.

Filed Oct. 16, 1978, Ser. No. 952,549
Int. Cl.³ F22B *27/00*
U.S. Cl. 122—41 **21 Claims**

1. A high efficiency heat exchange device comprising a housing, a first heat exchange manifold disposed within said housing and forming a lower floor of a combustion chamber disposed directly thereabove, a second heat exchange manifold disposed within said housing and positioned below said first manifold, said manifolds spaced apart from each other by baffles forming first labyrinth passages, said manifolds including conduit means, means causing a fluid working medium to flow through said conduit means so as to heat said medium, means for introducing and burning a hydrocarbon fuel in said combustion chamber and for directing the resultant flame downwardly towards said first heat exchange manifold, means for exhausting the combustion gases of said burning outside of said housing, means for introducing a pressure gradient from top to bottom in said housing whereby said combustion gases are downwardly directed over and under said manifolds prior to their exhaust from said housing.

18. A high efficiency method of heating a working fluid in a heat exchange device including a housing, a first heat exchange manifold disposed within said housing and forming the lower floor of a combustion chamber disposed directly thereabove,



said manifold including conduit means having a flame shield provided thereon and in direct contact therewith, comprising, introducing a hydrocarbon fuel and oxygen into said combustion chamber and igniting the same, directing the resultant flame downwardly against said conduit means with the hottest part of said flame generally directly impinging thereon so as to establish a high temperature gradient between said flame and said conduit means such that the working fluid rapidly absorbs heat from said flame, maintaining a pressure gradient in said housing so that the lower part thereof is at a lower pressure and thereby directing the combustion gas from said burning over said manifold and directing working fluid through said conduit so that heat from said flame is transferred through said conduit means to said working fluid.

4,232,635

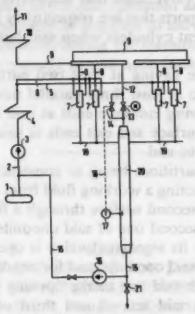
METHOD OF IMPROVING THE PERMISSIBLE LOAD-VARYING SPEED OF A ONCE-THROUGH STEAM GENERATOR AND DEVICE FOR PERFORMING THE METHOD

Georg Lösel, Uttenreuth, Fed. Rep. of Germany, assignor to Kraftwerk Union Aktiengesellschaft, Mülheim, Fed. Rep. of Germany

Filed Dec. 18, 1978, Ser. No. 970,564
Claims priority, application Fed. Rep. of Germany, Dec. 27, 1977, 2758278
Int. Cl.³ F22D *7/00*
U.S. Cl. 122—406 ST **3 Claims**

1. Method of improving the permissible load-varying speed of a once-through steam generator having a water separating vessel connected between a heating surface of the once-through steam generator and a heating surface of a superheater with a valve connected into a steam delivery line extending from the water separating device to the superheater heating surface, the valve being openable during start-up and shut-

down of the once-through steam generator, which comprises closing the valve to such a limited extent, depending upon the temperature of the water separating vessel, that the tempera-



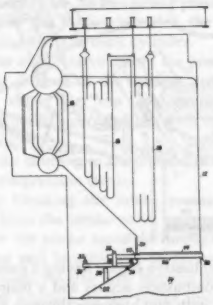
ture of the water separating vessel corresponds to boiling temperature of feedwater supplied to the once-through steam generator at a pressure at which a transition occurs with respect to pure once-through operation.

4,232,636

MAINTENANCE PLATFORM BUILT UPON RETRACTABLE SUPPORT BEAMS

George J. Prohazka, Simsbury, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Apr. 9, 1979, Ser. No. 28,036
Int. Cl.³ F22G 5/00
U.S. Cl. 122—479 R **7 Claims**



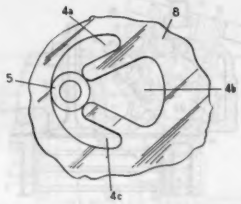
1. A vapor generating unit having waterwalls that enclose an upright combustion chamber, a nose projection in one of said waterwalls inclined to extend obliquely into said chamber to form a restriction between upper and lower parts thereof, a superheater in the upper part of the combustion chamber, an opening in said waterwall forming the nose projection, a platform adapted to traverse the opening and extend across the restricted portion of the combustion chamber, said platform including an elongate beam, and support means on the inclined waterwall adapted to support said beam for lateral movement through said opening from a position outside the combustion chamber to a position that bridges the restricted portion thereof.

4,232,637

SURFACES FOR COMBUSTION CHAMBER OF INTERNAL COMBUSTION ENGINE HAVING CONTROLLED FUEL INJECTION

Jacques Pichard, Meudon, France, assignor to Le Moteur Moderne, Boulogne Billancourt, France

Continuation of Ser. No. 815,023, Jul. 12, 1977, abandoned. This application Apr. 26, 1979, Ser. No. 33,494
Claims priority, application France, Jul. 20, 1976, 76 22142; May 3, 1977, 77 13313
Int. Cl.³ F02B 3/00, 23/00
U.S. Cl. 123—263 **11 Claims**



1. In an internal combustion engine with controlled ignition, including at least a cylinder closed by a cylinder head, a piston reciprocating in the cylinder in a cycle between a top dead centre and a bottom dead centre, a main chamber and a prechamber forming a high turbulence combustion chamber, a fuel injector and a controlled ignition device, and means for controlling injection of the fuel so as to greatly increase the advance with the load on the engine, wherein the prechamber is formed in the cylinder head and the fuel injector and the controlled ignition device emerge into the prechamber, the improvement wherein the main chamber includes adjacent elementary chambers formed at least in the cylinder head, the lower face of the cylinder head extending between said elementary chambers and the upper face of the piston forming an impelling surface surrounding the prechamber, the inlets of the chamber and prechamber opening into the impelling surface without throttle between the prechamber, the elementary chambers, and the main chamber during the complete cycle of the piston, whereby due to the absence of throttle between the prechamber and the main chamber and between the prechamber and the elementary chambers, and the cooperation of the fuel controlled injection means, the combustion on low load is confined within the prechamber by a free circulation of air from the elementary chambers into the prechamber under the action of the piston arriving at top dead centre, and the combustion on high load spreads out freely from the prechamber into the elementary chambers as the piston goes down from top dead centre.

4,232,638

INTERNAL COMBUSTION ENGINE EQUIPPED WITH AN AUXILIARY COMBUSTION CHAMBER

Takeshi Takahashi, Susono, and Hiromichi Yanagihara, Gotenba, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

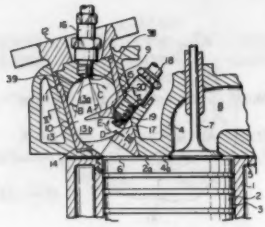
Filed Feb. 22, 1979, Ser. No. 14,163
Claims priority, application Japan, May 11, 1978, 53/54963
Int. Cl.³ F02B 19/10
U.S. Cl. 123—260 **12 Claims**

1. An internal combustion engine comprising:
a cylinder block having a cyliner bore therein;
a piston reciprocally movable in said cyliner bore;
a cyliner head fixed onto said cyliner block and forming therein an auxiliary chamber having an axis, said cyliner head and said piston defining a main chamber therebetween;
a raised portion formed on one side of an inner wall of said

auxiliary chamber and dividing said auxiliary chamber into a first auxiliary chamber and a second auxiliary chamber;

a connecting passage communicating sadi main chamber with said auxiliary chamber and tangentially connected to an inner wall of said second auxiliary chamber, which is located at a position opposite to said raised portion with respect to the axis of said auxiliary chamber;

a spark plug arranged in a recess formed beneath said raised portion in said second auxiliary chamber, and;



a fuel injector arranged in said first auxiliary chamber and having a first injection nozzle and a second injection nozzle, said first injection nozzle being directed to a tip of said raised portion and always injecting fuel independently of operating condition of the engine for forming a rich air-fuel mixture in said recess, said second injection nozzle injecting fuel when the load of the engine is increased beyond a predetermined level and being directed to the inner wall of said auxiliary chamber, which is located at a position opposite to said raised portion with respect to the axis of said auxiliary chamber.

4,232,639

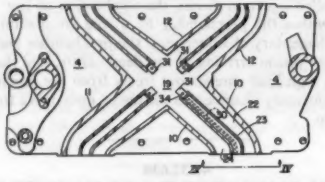
ENGINE WITH ADDITIONAL SHARED FLOW CONTROL RUNNER FOR TWO CYLINDERS

Donald J. Shaffer, P.O. Box 88, Upper Strasburg, Pa. 17265

Filed Mar. 26, 1979, Ser. No. 24,049

Int. Cl.³ F02B *75/18*

U.S. Cl. 123—52 MV **9 Claims**



1. A head for an internal combustion engine having an air intake manifold and engine block with plural cylinders, comprising:

a first surface for engagement with the corresponding surface of an engine block having in it the engine cylinders;

a plurality of intake ports opening through said first surface so as to be in communication with respective cylinders when said head is assembled on the block;

a plurality of exhaust ports extending through said first surface so as to be in communication respectively with the cylinders when said head is assembled on the block;

a valve seat in each of said intake ports and exhaust ports;

a plurality of intake and exhaust valves movable between opened and closed positions with respective ones of said intake and exhaust valve seats;

a second surface on said head for mating engagement with an intake manifold;

an intake opening in said second surface;

an intake passage extending from said intake opening to two adjacent intake valve seats that respectively lead to two adjacent intake ports that are respectively in communication with adjacent cylinders when said head is assembled on the block;

said intake passage having at least two partitions dividing said passage into at least three parallel non-communicating conduits having entrance ends at said intake opening of said second surface and exit ends at said two adjacent intake valve seats; and

said passage and partitions being so constructed as to form means for conducting a working fluid from said one intake opening in said second surface through a first one of said conduits and a second one of said conduits to one intake valve seat when its associated valve is open exclusive of the third one of said conduits, and for conducting a working fluid through said one intake opening in said second surface through said second and third conduits to the other of said intake valve seats when its associated valve is open exclusive of said first conduit, so that two out of the three conduits may be used for each of the cylinders to provide a large flow passage with good flow characteristics provided by a partition at high engine speed.

4,232,640

INDUCTION SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

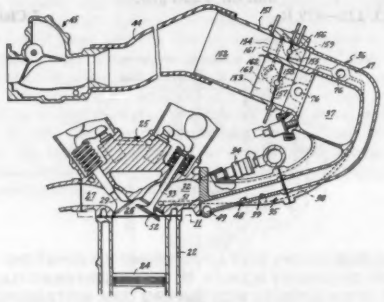
Hiromitsu Matsumoto, Hamamatsu, and Keiichi Sugiyama, Shizuoka, both of Japan, assignors to Yamaha Hatsukoko Kabushiki Kaisha, Iwata, Japan

Filed Nov. 13, 1978, Ser. No. 959,442

Claims priority, application Japan, Nov. 22, 1977, 52/140364

Int. Cl.³ F02B *17/00, 3/00*

U.S. Cl. 123—308 **9 Claims**



1. In an internal combustion engine having a variable volume chamber in which combustion occurs and a main intake passage communicating with said chamber through a main intake port for delivering a charge thereto, an auxiliary intake passage communicating with said chamber through an auxiliary intake port, said auxiliary intake passage having an effective cross-sectional area substantially less than the effective cross-sectional area of said main intake passage for causing a given mass flow of charge through said auxiliary intake port to enter said chamber at a significantly greater velocity, valve means including at least one valve for controlling the ratio of the communication of said ports with said chamber during a given cycle of operation of said engine, and positioning means including an operator controlled element for positioning said valve means in response to the load on the engine for causing substantially all of the idle and partial load charge requirements of the engine to be supplied by said auxiliary intake

passage and substantially all of the high load charge requirements by said main intake passage, the improvement comprising said positioning means providing linear movement of the one valve in response to movement of the operator controlled element from idle to off idle operation and non-linear movement of said one valve in response to movement of the operator controlled element during the transition of flow from said auxiliary intake passage to said main intake passage.

4,232,641

METHOD AND DEVICE FOR IMPROVING THE EFFICIENCY OF INTERNAL COMBUSTION ENGINES

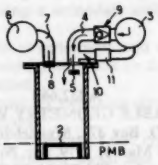
Rémi Curtil, Eaubonne, France, assignor to Societe d'Etudes de Machines Thermiques S.E.M.T., Saint-Denis, France

Filed Mar. 2, 1978, Ser. No. 882,758

Claims priority, application France, Mar. 7, 1977, 77 06614; Feb. 14, 1978, 78 04140

Int. Cl.³ F02D *13/00*; F02B *25/00*

U.S. Cl. 123—76 **12 Claims**



1. A method for improving the efficiency of a four-stroke cycle internal combustion engine having an intake manifold, at least one cylinder, and for each cylinder a piston, an exhaust valve, an intake valve, and an intake passageway between the intake manifold and the intake valve, the method comprising for each engine cycle in each cylinder:

opening the intake valve before the piston reaches top dead center at the end of the exhaust stroke and shutting the exhaust valve after top dead center during the intake stroke to define a period when both valves are open simultaneously;

retarding the shutting of the intake valve until after the start of the compression stroke;

selectively blocking the intake passageway at a location spaced from the intake valve to permit one-way flow of gas from the intake manifold through the intake passageway past said location but to prevent, at least for light engine loads, reverse flow through the intake passageway past said location to the intake manifold, said blocking location being selected to create a reserve chamber of predetermined volume in the intake passageway between the intake valve and said location, a reserve of gas being compressed in said chamber while the intake valve is open during the compression stroke and then being expanded through the intake and exhaust valves during the next period of simultaneous opening thereof to provide improved scavenging of the cylinder at the start of each intake stroke; and

opening a path between the intake valve and the intake manifold at high engine loads for permitting the escape of at least part of said compressed gas reserve back into said manifold, thereby reducing the effective compression ratio at high load.

4,232,642

IGNITION TIMING CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINES

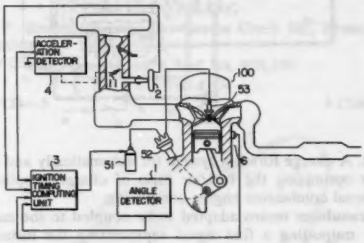
Hiroaki Yamaguchi, Anjo; Tadashi Hattori; Minoru Nishida, both of Okazaki; Kenji Goto, Susono; Daisaku Sawada, Susono, and Takashi Shigematu, Susono, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota and Nippon Soken, Inc., Nishio, both of, Japan

Filed Nov. 28, 1978, Ser. No. 964,153

Claims priority, application Japan, Dec. 9, 1977, 52-148524

Int. Cl.³ F02P *5/14*

U.S. Cl. 123—416 **5 Claims**



1. An ignition timing control system for an internal combustion engine comprising:

first detecting means, responsive to an intake condition of said engine, for producing a first detection output indicative of the detected intake condition;

second detecting means, responsive to the rotation of said engine, for producing a second detection output indicative of the detected rotational speed;

third detecting means for producing a third detection output indicative of a rate of change in an operator induced demand for acceleration of said engine in excess of a predetermined rate of change in demand;

fourth detecting means, responsive to the temperature of said engine, for producing a fourth detection output indicative of the detected temperature;

fifth detecting means, responsive to an operating condition of said engine for producing a fifth detection output related to the acceleration of said engine between a first selected instant in time and a second selected instant in time;

first setting means, responsive to said first and second detection outputs, for producing a first setting output indicative of the first ignition advance corresponding to the detected intake condition and rotational speed;

second setting means for producing a second setting output in response to said third detection output, said second output being indicative of the second ignition advance which gradually changes from a reference value determined in dependence on said fourth and fifth detection outputs;

correcting means responsive to said first and second setting outputs, for correcting said first setting output in accordance with said second setting output and producing an output indicative of the corrected ignition advance, said output being equal to said first setting output when said second setting output is absent; and

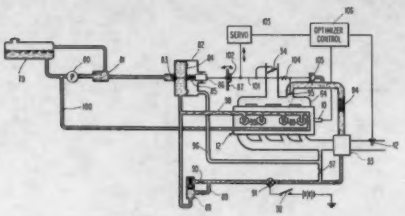
igniting means responsive to said output of said correcting means and effective to produce an ignition spark at said corrected ignition advance.

4,232,643

CHARGE FORMING SYSTEM FOR MAINTAINING OPERATION OF AN INTERNAL COMBUSTION ENGINE AT ITS LEAN LIMIT

Ervin Leshner, and Michael D. Leshner, both of Cherry Hill, N.J., assignors to Fuel Injection Development Corporation, Bellmawr, N.J.

Filed Nov. 22, 1976, Ser. No. 743,764
Int. Cl.[3] F02B *3/00*; F02M *17/18*; F02B *33/00*
U.S. Cl. 123—440 **14 Claims**



1. A charge forming system for automatically and continually optimizing the fuel/air ratio of charge supplied to an internal combustion engine comprising:

transducer means adapted to be coupled to the engine for outputting a first signal representing the instantaneous combustion efficiency of the engine, said transducer means including means for producing signals representing the rate of fuel flow and the engine power output;

means for combining said signals to produce an output signal representing instantaneous combustion efficiency of the engine; and

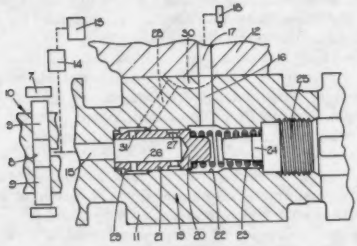
a charge control for changing the fuel/air ratio of the charge, including a servomechanism coupled to said transducer means and responsive to changes in the level of said first signal to decrease the fuel/air ratio of the charge when instantaneous combustion efficiency of the engine is increasing, and to increase the fuel/air ratio of the charge when the instantaneous combustion efficiency of the engine is decreasing.

4,232,644

FUEL PUMPING APPARATUS

James C. Potter, and Stanislaw J. A. Sosnowski, both of London, England, assignors to Lucas Industries Limited, Birmingham, England

Filed Dec. 20, 1978, Ser. No. 971,495
Claims priority, application United Kingdom, Jan. 19, 1978, 2178/78
Int. Cl.[3] F02M *39/00*; F04B *29/00*
U.S. Cl. 123—450 **3 Claims**



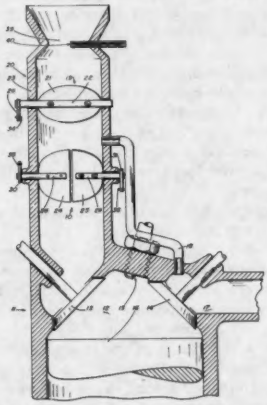
1. A liquid fuel injection pumping apparatus for supplying fuel to internal combustion engines and of the kind comprising an injection pump, a rotary distributor member housed in a body, the injection pump and distributor member being driven in use, in timed relationship with an associated engine having injection nozzles, the distributor member including a delivery passage through which fuel delivered by the injection pump flows and which registers in turn with a plurality of outlet ports which in use are connected to the injection nozzles of the associated engine respectively during successive delivery strokes of the injection pump, a spring loaded delivery valve mounted within the distributor member and positioned in said passage, said delivery valve being opened during the delivery of fuel by the injection pump and when the delivery of fuel by the injection pump has ceased, closing to allow a limited volume of fuel to return to the injection pump from the outlet ports, a branch passage formed in the distributor member, the branch passage communicating with the injection pump, said branch passage extending to the periphery of the distributor member for communication with an outlet port in advance of the communication of the same outlet port with the aforesaid passage, the size of the outlet ports and the spacing of the passages about the periphery of the distributor member being such that the initial volume of fuel delivered by the injection pump flows to the outlet ports by way of said branch passage, the fuel flow then being gradually diverted to the aforesaid passage to achieve gradual opening of the delivery valve.

4,232,645

VARIABLE GEOMETRY WHIRLER

Samuel Shiber, P.O. Box 371, Mundelein, Ill. 60060

Filed Mar. 9, 1979, Ser. No. 19,132
Int. Cl.[3] F02M *29/06*
U.S. Cl. 123—590 **7 Claims**



1. In an internal combustion engine having a combustion chamber, an induction manifold for delivering an explosive charge into said chamber and a throttle means disposed in said manifold for selectively and variably closing and restricting flow through said manifold,

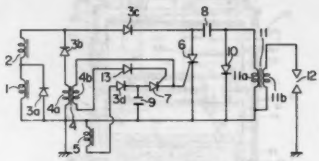
the improvement wherein a variable geometry whirling creating apparatus is disposed in said manifold for mixing and homogenizing said explosive charge when said throttle is partially open, said apparatus adapted to vary its geometry and to minimize its whirling creating action when said throttle is fully open.

4,232,646

IGNITION SYSTEM FOR INTERNAL COMBUSTION ENGINES WITH A MAGNETO GENERATOR

Masahiro Asai, Hekinan, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Filed May 22, 1979, Ser. No. 41,302
Claims priority, application Japan, May 24, 1978, 53-62108
Int. Cl.³ F02P 3/08
U.S. Cl. 123—600 **3 Claims**



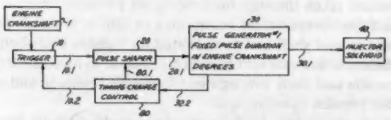
1. An ignition system for internal combustion engines comprising:
- a magneto generator having a coil for inducing therein an output in synchronism with the rotation of a crank shaft of an internal combustion engine,
- a capacitor connected to said coil of said magneto generator through a diode and being charged by the output produced in said coil,
- an ignition coil having a primary coil connected to said capacitor and having a secondary coil connected to an ignition plug,
- a thyristor connected in series with said capacitor and said primary coil of said ignition coil to form a discharging path of said capacitor,
- an auxiliary semiconductor switching element connected to a gate of said thyristor,
- means for converting an output of said coil of said magneto generator into an ignition signal and for applying said ignition signal to a gate of said auxiliary semiconductor switching element,
- a timing generator for generating an output in synchronism with the rotation of the crank shaft of said internal combustion engine advanced in phase with respect to a predetermined ignition signal, said auxiliary semiconductor switching element being turned on upon occurence of said predetermined ignition signal, and
- an auxiliary capacitor connected to said timing generator to store an output thereof and having a discharging path including said auxiliary semiconductor switching element and a gate-cathode circuit of said thyristor thereby to apply a discharging current of said auxiliary capacitor to said gate-cathode circuit of said thyristor only when said auxiliary capacitor has been charged and said auxiliary semiconductor switching element is turned on by a successive ignition signal.

4,232,647

CONTROL CIRCUIT FOR DIESEL INJECTION SYSTEM

Howard E. Van Siclen, Jr., Sidney, N.Y., assignor to The Bendix Corporation, Southfield, Mich.

Filed Nov. 13, 1978, Ser. No. 960,513
Int. Cl.³ F02D 5/02
U.S. Cl. 123—478 **21 Claims**



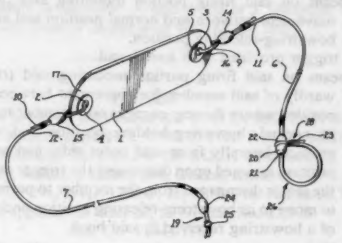
1. A system for controlling a solenoid operated fuel injector of an internal combustion engine of the type having a crankshaft which rotates during the operating cycle of the engine, said circuit comprising:
- first means for generating a trigger pulse for each operating cycle of said engine; and
- second means, responsive to each trigger pulse, for generating an energizing pulse to energize the injector solenoid for each operating cycle of the engine, said second means including:
  - means for limiting the duration of said energizing pulse to a fixed number of degrees of engine crankshaft rotation over a preselected range of rotational speeds of said engine crankshaft, said limiting means consisting of electronic circuitry.

4,232,648

THROWING SLING

Douglas P. Brown, 18 Loba Dr. Groom Creek Rt., Prescott, Ariz. 86301

Filed Dec. 18, 1978, Ser. No. 970,290
Int. Cl.³ F41B 3/04
U.S. Cl. 124—5 **5 Claims**



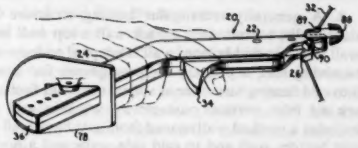
1. A projectile throwing sling comprising a supple pocket, thongs engaging opposite ends of said pocket, and weight means comprising a perforated bead that also serves to tie the release thong to the release end of the pocket, said weight means being carried at the release end of said pocket whereby the release of a projectile is aided by the weight means causing said release end of the pocket to snap open crisply upon the throw of a projectile.

4,232,649

BOW STRING TRIGGER RELEASE

Holless W. Allen, and Douglas T. Allen, both of Billings, Mo. 65610

Filed May 16, 1978, Ser. No. 906,944
Int. Cl.³ F41B 5/00
U.S. Cl. 124—35 A **20 Claims**



1. A trigger-operated bowstring release comprising:
- an elongated, relatively narrow, rigid body of dogleg configuration having an elongated front firing portion merging with an elongated rear handle portion provided with a configuration adapting said handle portion to be gripped in the palm of an archer's hand, said portions being angularly disposed with respect to each other to present said dogleg configuration,

stop means on said handle portion spaced from said firing portion for receiving the heel of an archer's hand when the handle portion is gripped,

said firing portion having opposed, inner and outer longitudinally extending sides facing laterally toward an archer and laterally away from the archer respectively when the handle portion is gripped by the archer and the release is held in a shooting position adjacent the archer's head with said firing portion extending forwardly from said handle portion and pointing generally in the direction of a target,

said outer side of the firing portion and said handle portion defining an obtuse angle thereby providing the dogleg configuration,

a holding member associated with said firing portion and provided with an open hook for engaging and holding a bowstring, and said member having a normal, bowstring-holding position in which the hook is spaced from said body forwardly from said handle portion and projects laterally from said outer side clear of said body to hold the bowstring, permitting the release when held by the archer to be moved to a disposition of unobstructed engagement with the bowstring merely by the archer manipulating the entire body,

means on said firing portion mounting said member for movement between said normal position and an operated, bowstring-releasing position,

a trigger provided with a sear, and

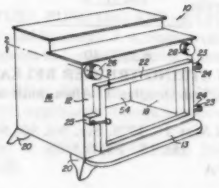
means on said firing portion mounting said trigger rearwardly of said member for movement between a normal position where the sear engages said member to retain it in its normal, bowstring-holding position and the trigger projects laterally from said outer side, and an operated position assumed upon depressing the trigger and in which the sear is disengaged from the member to permit the same to move to its bowstring-releasing position under the force of a bowstring received in said hook.

4,232,650

BAFFLED STOVE

Bruce A. Frank, Salt Lake City, Utah, assignor to Baffle Stove Company Inc., Salt Lake City, Utah

Filed Aug. 30, 1977, Ser. No. 937,966
Int. Cl.³ F24C *1/14*
U.S. Cl. 126—77 **10 Claims**



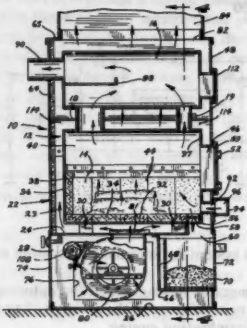
1. A generally rectangular heating structure having two sides walls, a front wall, a back wall a top wall and a bottom wall wherein said bottom wall is adapted to form a firebox for receiving fuel, a primary air passageway for introducing air into said heating structure at a level near said firebox, a secondary air inlet vertical passageway wherein said passageway includes a vertical wall spaced from said back wall and fixed to said bottom wall and to said side walls and a horizontal passageway includes a pair of spaced apart horizontally positioned baffle plates sealed at their side ends to said side walls, and a flue outlet for carrying gases of combustion to the atmosphere, said vertical and horizontal passageways forming a continuous conduit whereby secondary air enters near the bottom of the vertical passageway for preheating and exits through an outlet in said horizontal passageway where said secondary air is combined with gases of combustion for secondary burning and circuitously flows outwardly through said flue outlet.

4,232,651

WOOD BURNING FURNACE

Eugene L. Lind, Aitkin, Minn., assignor to Lind's Manufacturing Inc., Aitkin, Minn.

Filed Jul. 9, 1979, Ser. No. 56,026
Int. Cl.³ F24H *3/02*
U.S. Cl. 126—110 E **7 Claims**



1. A solid fuel burning furnace including:

A. a combustion enclosure made up of:

(1) a closed, generally rectilinear, lower fire box being defined at an upper portion thereof by a semicylindrical roof dome,

(2) a closed, cylindrical, upper smoke chamber spaced above and parallel to said fire box roof dome,

(3) a rearward upright smoke conduit open between said fire box roof dome and said smoke chamber at a rearward portion of each, and

(4) a forward upright smoke conduit open between said fire box roof dome and said smoke chamber at a forward portion of each;

B. an outer, generally rectilinear, furnace shell encompassing said combustion enclosure, said shell also providing a closed fan compartment below said combustion enclosure;

C. a fire box loading collar open to said fire box through a forward wall of said shell for loading fuel inside said fire box;

D. a normally closed fire door mounted with respect to said collar to be openable to permit access to said fire box;

E. a stack open to a rear portion of said smoke chamber and extending out through said shell;

F. a blower in said fan compartment;

G. heating air passage baffles integral with the interior of said shell;

H. said baffles and the interior of said shell being in generally parallel spaced relation to the flat and cylindrical surfaces of said fire box and smoke chamber so as to provide a heating air passage of generally uniform cross sectional area when measured along progressively higher horizontal planes from the bottom of the fire box to halfway up the smoke chamber;

I. a plenum opening being provided in an upper wall of the furnace shell, said plenum opening being of at least the cross sectional area of the smallest area of a horizontal section taken through the heating air passage;

J. said fan compartment being open to said heating air passage in said shell and to unheated air outside said shell;

K. means to activate said blower to cause it to force air from outside said shell, through said heating air passage and out said plenum opening; and

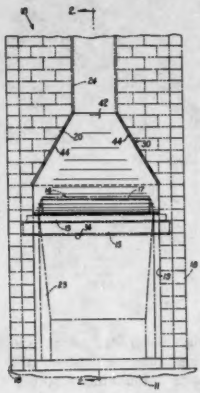
L. draft means to introduce primary combustion air into a lower portion of said fire box through said shell.

4,232,652

FIREPLACES OF THE TYPE HAVING FIREBOXES CONSTRUCTED OF FIREBRICK

Frank J. Serwatowski, 12155 Spencer Rd., Milford, Mich. 48042

Filed Dec. 20, 1977, Ser. No. 862,370
Int. Cl.³ F24B 1/18
U.S. Cl. 126—120 **1 Claim**



1. Improvement in a fireplace of the type having a firebox constructed of firebrick, said fireplace having a chimney and a flue liner therefor and a metal damper mechanism on top of the firebox, said improvement comprising a prefabricated smoke chamber liner having front and side walls made of flat sheets of fire resistant material which are capable of being assembled and fastened together at the job site where the fireplace is being constructed, said fireplace having a downdraft cavity behind said firebox, said smoke chamber liner constructed to be disposed inside of the fireplace during building thereof above both the firebox and the downdraft cavity and below the chimney flue liner, said smoke chamber liner constructed to be supported in the fireplace on its side walls on brickwork so that its front and side walls extend upwardly and inwardly so that the top of said smoke chamber liner corresponds with the opening for the flue liner and the bottom thereof corresponds with that for the firebox, the front wall of said smoke chamber liner having an extension at the lower end thereof which projects downwardly and outwardly below the side walls thereof, said damper mechanism being of the type having a flat base which is horizontally disposed in said fireplace, said damper mechanism being disposed in the vertical space between the lower edges of said side walls and the lower edge of said extension, said lower edge of said extension being straight and engaging the flat base of the damper mechanism, and the opposite side edges of the extension being disposed in a vertical plane.

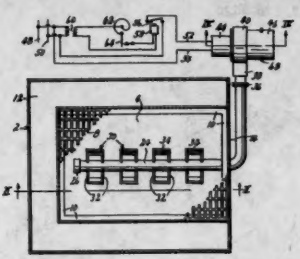
4,232,653

WOOD-BURNING FURNACE

James H. Otterpohl, Rte. 3 Box 35B, Clinton, Ark. 72031

Filed Mar. 8, 1979, Ser. No. 18,645
Int. Cl.³ F24C 1/14
U.S. Cl. 126—77 **9 Claims**

1. A wood-burning furnace comprising:
a. a furnace body providing a combustion chamber for receiving wood to be burned,
b. an open-work grate forming the floor of said combustion chamber for supporting said wood,
c. an ash pit disposed beneath said combustion chamber and communicating therewith through said grate,
d. air supply means operable to supply combustion air to said ash pit, beneath said grate, said combustion chamber and ash pit being otherwise sealed against the entry of air, and
e. thermostatically actuated control means, responsive to the air temperature in a comfort zone to be heated by said furnace, to regulate said air supply means to supply air at



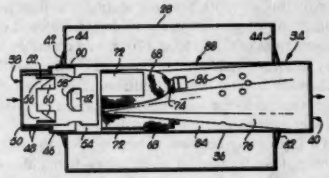
a rate sufficient to support full combustion of said wood when said control means calls for heat, and to regulate said air supply means to supply air at a rate sufficient only to maintain combustion of said wood at a minimum rate when said control means does not call for heat.

4,232,654

HEAT RECOVERY DEVICE FOR USE IN RETURN AIR DUCT OF FORCED AIR FURNACE FOR RECOVERING HEAT FROM THE FLUE OF SUCH FURNACE

Fred J. Gary, R.F.D. #1, Box 164, Glasco, Kans. 67445

Division of Ser. No. 891,171, Mar. 29, 1978, Pat. No. 4,176,787.
This application Mar. 23, 1979, Ser. No. 22,973
Int. Cl.³ F24H 7/00
U.S. Cl. 126—400 **2 Claims**



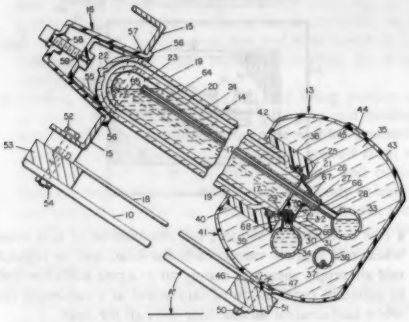
1. Apparatus for transferring heat from a first gas flowing through a heat conductive tubular member to a second gas in contact with the exterior surface areas of said member, including:
a heat trap disposed within said member adjacent said exterior surface areas of the latter,
said heat trap including a heat conductive mesh-like material through which said first gas may pass,
portions of said material being in heat conducting contact with interior surface portions of said member.
said material functioning to extract and store heat from said first gas, and further functioning to transfer said extracted heat by conduction and radiation thereof to said interior surface portions of said member for subsequent conduction to said exterior surface areas of said member,
said mesh-like material comprising a plurality of separate, elongate, tubularly-shaped structures,
each of said structures having one extremity thereof downstream in the flow of said first gas essentially closed to prevent free flow of said first gas therethrough,
the opposite extremity of said structure upstream in said flow from said one extremity presenting an opening to said flow allowing said first gas to freely enter said structure.

4,232,655

SOLAR ENERGY COLLECTION

Joseph R. Frissora, and Michael H. Platt, both of Corning, N.Y., assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Jun. 26, 1978, Ser. No. 919,029
Int. Cl.³ F24J 3/02
U.S. Cl. 126—420 **21 Claims**



1. A solar energy conversion apparatus of the type wherein a heat transport liquid is circulated between a solar energy collection area and a thermal energy storage and exchange device which comprises in a combination:

a plurality of solar collectors receptive of solar radiation, each said collector comprising a double-wall tubular collector with a sealed, annular evacuated space between the walls, the collector being closed at one axial end and open at the other, an energy absorbing surface on the inner wall, the outer wall being transparent, and a cup element providing a mouth opening sealingly connected about the open end of said collector to define a closed chamber for circulation of liquid to and from said chamber to be heated by absorbed solar radiation at said inner wall, each said chamber having top and bottom regions,

a storage tank for said liquid disposed at a substantially lower elevation from said collectors,

a first liquid line connected between said storage tank and the bottom region of each of said chambers the latter being connected in parallel, for conducting liquid therebetween,

a restricted flow passage in the first liquid line connection to said bottom region of each of said parallel connected chambers extending through the cup element,

a pump in the first liquid line operable for pumping liquid in said line from said tank to said collector chambers,

a second line including plural end openings, means to dispose said plural end openings such that one end opening is in the top region of each of said chambers, and said second line is also connected to the top space in the storage tank for (a) venting air in the upper region of the chambers to the storage tank, and (b) conducting liquid entering said plural end openings by gravity flow to the tank, and

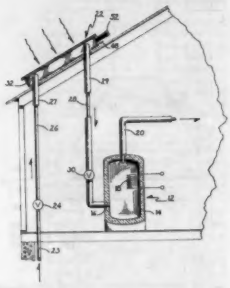
control means responsive to preselected temperature condition existing in one or more of said chambers for operating the pump and thereby pumping liquid from the storage tank to the solar collector chambers, the flow of liquid into each of said chambers being at a rate less than full flow in said end opening of the second line therein, whereby the overflow liquid from the chambers and air return to the storage tank are each through said second line, said pumping being discontinued whenever such preselected temperature condition in said chambers no longer exists.

4,232,656

INTEGRAL STORAGE COLLECTOR SOLAR HEATING SYSTEM

W. Peter Teagan, Acton, Mass., assignor to Arthur D. Little, Inc., Cambridge, Mass.

Filed Mar. 12, 1979, Ser. No. 19,905
Int. Cl.³ F24J 3/02
U.S. Cl. 126—420 **33 Claims**



1. A solar heating system for heating water comprising:

an integral storage collector exposed to solar illumination, the storage collector including absorber means for absorbing solar energy, a heat storage medium of large heat capacity and high thermal conductivity directly heated by said absorber means, and a water flow path in heat exchange relationship with the heat storage medium;

a water outlet from said water flow path connected as a pressurized, heated water supply; and

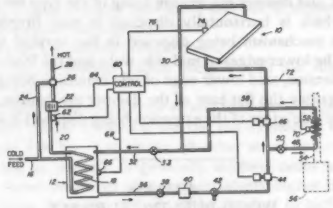
a water inlet to said water flow path connected to a primary pressurized water supply line such that line pressure forces fresh water through the water flow path of the integral storage collector as heated water is taken from the water outlet.

4,232,657

SYSTEM FOR USE WITH SOLAR COLLECTOR

Francis H. Killorin, P.O. Box 353, Snug Harbor, Duxbury, Mass. 02332

Filed Apr. 19, 1979, Ser. No. 31,534
Int. Cl.³ F24J 3/02
U.S. Cl. 126—427 **7 Claims**



1. A system for use with a solar collector, comprising

(a) a combination storage tank and a heat exchanger,

(b) first conduit means connected between said tank and said collector and defining a primary circulating loop,

(c) second conduit means connected between said primary loop and a waste heat source, and defining a secondary circulating loop,

(d) a liquid heat exchange medium in said loops,

(e) a pair of pumps operatively connected to said primary loop for circulating said medium selectively through said primary and secondary loops,

(f) pump control means connected to said pumps for selective operation thereof,

(g) one of said pumps being located ahead of said secondary loop and having a pumping capacity when operated alone to circulate said medium only through said secondary loop, and,

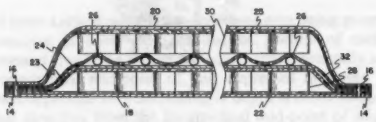
(h) third conduit means connected to said heat exchanger and defining a separate flow path for feed water therethrough to be heated thereby to provide hot water service.

4,232,658

SOLAR COLLECTOR PANEL

James D. Gessford, 20 S. First East, P.O. Box 87, Bancroft, Id. 83217

Filed Dec. 8, 1977, Ser. No. 858,584
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—441 **7 Claims**



1. A solar collector panel comprising:

a first fiberglass matrix saturated with a catalyzed liquiform resin;

a second fiberglass matrix saturated with a catalyzed liquiform resin;

a layer of honeycomb material bonded between said first and second fiberglass matrices, said layer comprising a plurality of individual cell structures that are substantially perpendicular to the surface of one of said matrices;

a layer of gel coat type material bonded to the surface of one of said first or second fiberglass matrices; and

a plurality of tubes bonded in heat-transfer relation to said layer of gel coat type material.

7. A method of manufacturing solar collector panels, comprising the steps of:

saturating a first layer of fiberglass mat with a catalyzed liquiform resin;

placing a first layer of unimpregnated, porous material having a honeycomb structure onto said saturated first layer of fiberglass mat;

sealing said first honeycomb layer by placing a gas-impervious layer of material on top of said first honeycomb layer;

liberating styrene gas in response to said sealing step, thereby causing said resin to be at least partially drawn up into said first honeycomb layer;

removing said gas-impervious layer after said resin has at least partially cured;

saturating a second layer of fiberglass mat with catalyzed liquiform resin and placing said second layer on top of said first honeycomb layer;

bonding a plurality of tubes to the second fiberglass layer as the resin of the second fiberglass layer is cured;

saturating a third layer of fiberglass mat with catalyzed liquiform resin and draping said third layer over said tubes;

placing a second layer of honeycomb structure material on top of said third fiberglass layer; and

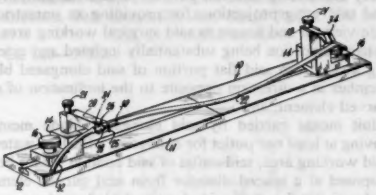
saturating a fourth fiberglass mat layer with catalyzed liquiform resin and placing said fourth layer on top of said second honeycomb layer, so as to form an enclosed solar collector panel.

4,232,659

VEIN HOLDER ASSEMBLY

William A. Dale, Nashville, Tenn., assignor to Codman and Shurtleff, Inc., Randolph, Mass.

Filed Jan. 8, 1979, Ser. No. 1,799
Int. Cl.³ A61B *19/00*
U.S. Cl. 128—1 R **4 Claims**



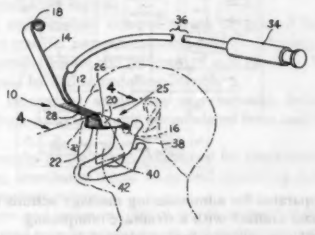
1. A vein holder assembly for use in the preparation of a vein segment during surgery comprising: an elongate base having a groove in its elongate direction; first slide means connected to said base and adapted to slide in said groove; first adjustable tightening means associated with said first slide means for tightening the same in a selected position on said base; a vein clamp mounted on said first slide means for closing off one end of a vein segment; second slide means connected to said base and adapted to slide in said groove; second adjustable tightening means associated with said second sliding means for tightening the same in a selected position on said base; a vein support mounted on said second slide means adapted to allow fluid to pass into said vein segment while supporting the same and while the other end of said vein segment is closed off by said vein clamp whereby said vein segment may be maintained in a fluid distended condition.

4,232,660

WINGED IRRIGATING SURGICAL RETRACTOR

Robert L. Coles, 13 New Haven Dr., Greenville, S.C. 29615

Continuation of Ser. No. 779,362, Mar. 21, 1977, abandoned. This application Mar. 26, 1979, Ser. No. 24,047
Int. Cl.³ A61B *17/02*
U.S. Cl. 128—20 **5 Claims**



1. A retractor device for use in surgical procedures in a surgical working area involving the jaw and oral areas comprising:

an elongated generally straight blade member having a distal end and a proximal end;

a curved element connected to said distal end of said blade member, said curved element being inclined downwardly from said blade member and being adapted for fitting over a bone process to form a fulcrum therewith;

a pair of opposed wing projections extending laterally in an inclined manner from said blade member providing an enlarged retracting surface for retracting tissue and muscle to provide access to said surgical working area and avoiding damage of adjacent tissue and muscle;

an elongated, generally flat, generally straight handle portion having a first and a second end, said first end of said handle portion being connected to said proximal end of said blade member;

said elongated blade member including a generally flat portion extending from said proximal end of said blade member to said distal end of said blade member and intermediately connecting said flat portion of said handle portion and said wing projections for providing an unrestricted side view of and access to said surgical working area;

said handle portion being substantially inclined and extending away from said flat portion of said elongated blade member in a direction opposite to the inclination of said curved element; and

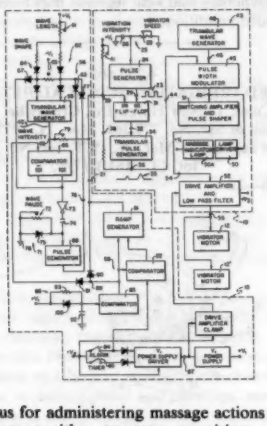
conduit means carried by said elongated blade member having at least one outlet for delivering a flush of water to said working area, said outlet of said conduit means being disposed at a spaced distance from said curved element and said distal end of said elongated blade and generally above said surgical working area when inserted therein so as to cause downward delivery of said water to said surgical working area in a flushing stream pattern and facilitate unrestricted viewing and working in said working area, and a remote end of said conduit means being adapted for connection to a syringe member for delivering said flush of water.

4,232,661

BODY MASSAGE APPARATUS

Earl A. Christensen, 107 Wilshire Ct., San Carlos, Calif. 94070

Filed Feb. 8, 1978, Ser. No. 875,984
Int. Cl.³ A61H *1/00*
U.S. Cl. 128—33 **18 Claims**



1. Apparatus for administering massage actions to a person in intimate contact with a structure comprising:

at least one vibrator motor adapted to be operatively connected to said structure to vibrate said structure in accordance with the waveform of a signal energizing said motor;

a pulse train generator controllable to generate a train of pulses of continually varying amplitude versus time relationship;

a function generator controllable to generate a modulating signal of varying amplitude versus time relationship different than that of said train of pulses and selected relative to said train of pulses to simulate therewith a traveling wave pattern, the frequency of said modulating signal being significantly lower than the frequency of said train of pulses;

a first coupling means for combining the modulating signal with the train of pulses to effect modulation of the amplitude versus time relationship of said pulses and thereby produce a modulated output signal simulative of a traveling wave pattern; and

a second coupling means for operatively connecting said first coupling means directly to the vibrator motor to energize said vibrator motor with a signal having substantially the same shape as said modulated output signal.

4,232,662

THERAPEUTIC DEVICE FOR A HUMAN BODY

S. Morgan Barber, P.O. Box 223, Yerington, Nev. 89447

Filed Nov. 6, 1978, Ser. No. 958,013
Int. Cl.³ A61F *5/00*
U.S. Cl. 128—71 **18 Claims**

1. In a therapeutic device for the human body in which a main frame pivotally mounts a body supporting structure for longitudinal tilting movements, said structure having an upper body supporting portion and a lower body supporting portion, the lower body supporting portion being connected with the upper body supporting portion by an elongated central frame member, the improvement comprising:

first means carried by the lower body supporting portion positioned to extend under each foot and form a support to limit endwise movement of the body in a downward direction, when the body supporting structure is tilted so as to elevate the head of a body thereon above a horizontal position;

second means carried by the lower body supporting portion positioned and operative to embrace each ankle area and adjacent foot instep area, and form a support to limit endwise movement of the body in an opposite downward direction, when the body supporting structure is tilted so as to lower the head of a body thereon below a horizontal position; said second means carried by the lower body supporting portion for embracing the adjacent foot instep area including an elongated lever having a lower and an outer end, the lower end of said lever being adapted for detachably engaging and pivotally supporting said elongated lever with respect to the lower body supporting portion; and

means adapted for intercoupling said lever near its outer end with the lower body supporting portion for retaining said lever in an engaged and locked position.

4,232,663

CERVICAL SUPPORT COLLAR

John E. Newton, P.O. Box 892, Burgaw, N.C. 28425

Filed Dec. 12, 1978, Ser. No. 968,796
Int. Cl.³ A61H *1/02*
U.S. Cl. 128—75 **5 Claims**

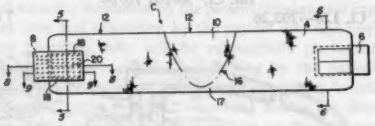
1. A cervical collar for placement around a user's neck, comprising:

an elongated pad of resilient foam material generally rectangular in cross-sectional configuration having two end portions, an inner surface for placement adjacent a user's neck, an outer surface, a top edge surface and a bottom edge surface, the distance between said top and bottom

edge surfaces being substantially constant along the length of said pad;

means at said end portions for detachably fastening said end portions together with said pad about the user's neck;

said pad having a depressed area in said inner surface at the longitudinal mid-portion of said pad extending from and including said top edge surface toward said bottom edge surface for the greater portion of the distance between said top and bottom edge surfaces, said depressed area being generally parabolic in outline with its apex toward said bottom edge surface; and,



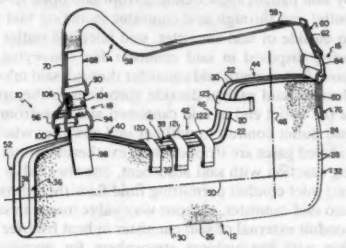
said inner surface within said depressed area being generally concave in form with the deepest portion of said depressed area being at said top edge surface generally at the longitudinal mid-point of said depressed area and with said depressed area decreasing in depth in either longitudinal direction from the longitudinal mid-point of said depressed area and decreasing in depth toward said bottom edge surface whereby, with the mid-portion of said top edge surface located underneath the user's chin, said depressed area acts to lessen pressure in the user's throat area.

4,232,664

ARM ELEVATOR AND SLING

Gerald Blatt, Ste. 440, 2840 Long Beach Blvd., Long Beach, Calif. 90806

Filed Jan. 11, 1979, Ser. No. 2,755
Int. Cl.³ A61F *5/40*
U.S. Cl. 128—94 **16 Claims**



1. An arm elevator and sling, comprising the combination of a substantially L-shaped, flexible envelope for receiving a portion of the arm of a patient including at least the elbow and the lower portion of the arm, said envelope being closed along the bottom and open at the top;

shoulder strap means for supporting said envelope;

first means for coupling the rear end of said strap means to said envelope adjacent the rear end thereof; and

second means for coupling the forward end of said strap means to said envelope in a variable position extending from the forward end thereof rearwards toward the rear end thereof, said second means including

a yoke assembly having two short pads, each of said pads having looped-fabric engaging hooks thereon,

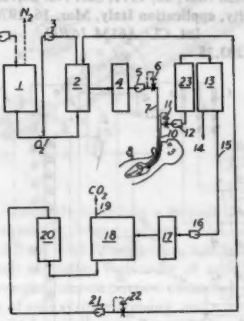
at least a portion of the outside surface of said envelope having looped-fabric thereon for releasably engaging said hooks.

4,232,665

PORTABLE LUNG APPARATUS

Vesper A. Vaseen, 9840 W. 35th Ave., Wheatridge, Colo. 80033

Continuation-in-part of Ser. No. 808,286, Jun. 20, 1977, abandoned. This application Jan. 10, 1979, Ser. No. 2,459
Int. Cl.³ A61M *16/00*
U.S. Cl. 128—200.24 **1 Claim**



1. A composite mechanical lung machine, consisting of:

medical oxygen supply means;

isotonic, breathable liquid oxygen saturator means connected to said oxygen supply means for saturating isotonic, breathable liquid with oxygen from said supply means;

first heat exchanger means connected to said oxygen saturator means for temperature adjustment of the breathable liquid;

means for introducing said oxygen saturated isotonic liquid into animal lung(s) cavity;

means for removing said isotonic liquid from the animal lung(s) cavity;

first transfer pump means for transferring said isotonic, breathable liquid from said first heat exchanger means to said introducing means;

first flow and pressure control means connected between said first transfer pump means and said introducing means for controlling flow and pressure of said isotonic, breathable liquid to said introducing means;

separator means for separating said isotonic, breathable liquid from aqueous liquids accumulated from said lung(s) cavity;

second transfer pump means connected for transferring said isotonic, breathable liquid from said removing means to said separator means;

second flow and pressure control means connected between said second transfer pump means and said removing means for controlling flow and pressure of said isotonic, breathable liquid from said removing means;

filter means connected to said separator means for separation and removal of particulate solids from the isotonic, breathable liquid accumulated from the lunt(s) cavity;

heat exchange sterilizer means connected to said filter means for heat stripping absorbed carbon dioxide from the breathable liquid accumulated in the lung(s) cavity and sterilizing said breathable liquid;

second heat exchanger means connected to said sterilizer means for temperature adjustment of the breathable liquid from said sterilizer means to a selected body use temperature;

third transfer pump means for transferring said isotonic, breathable liquid from said second heat exchanger means to said oxygen saturator; and

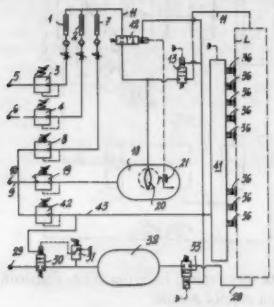
third flow and pressure control means connected between said third transfer pump means and said oxygen saturator means for controlling flow and pressure of said isotonic, breathable liquid from said third transfer pump means.

4,232,666

MEDICAL BREATHING APPARATUS

Aulo Savelli; Francesco Grianti; Giovanni Arcozzi, and Leonardo Di Bari, all of Pesaro, Italy, assignors to D G T S.r.l., Pesaro, Italy

Filed Mar. 15, 1979, Ser. No. 20,718
Claims priority, application Italy, Mar. 16, 1978, 21273 A/78
Int. Cl.[3] A61M *16/00*
U.S. Cl. 128—203.25 **6 Claims**



1. A rate of flow controlled automatic medical breathing apparatus comprising:

means for supplying a respiratory gas mixture including first conduit means wherein said mixture flows;

valve means in said first conduit means for controlling the flow of said respiratory gas mixture into the apparatus;

a first inspiration manifold downstream of said valve means;

a pressure stabilizer and governor means interposed in said first conduit means between said valve means and said first inspiration manifold;

second conduit means downstream of said first inspiration manifold, comprising at least two parallel conduits and having first flow regulating means in each of said parallel conduits;

a second inspiration manifold downstream of said first inspiration manifold, wherein said parallel conduits of said second conduit means are joined;

inspiration means connectable to a patient and including an inspiration conduit connected to said second inspiration manifold;

expiration means connectable to a patient and including an expiration conduit; and

second flow regulating means in said expiration conduit;

controlling means for controlling said first and second flow regulating means in said second conduit means and said expiration conduit so as to change the inspiration flow and expiration flow for a respiration cycle according to necessities imposed by the various pathological conditions of a patient;

and wherein said pressure stabilizer and governor means further comprises:

a constant volume reservoir;

supply means for supplying a fluid at a preselected pressure into said constant volume reservoir;

a variable volume member inside said reservoir, the interior of said variable volume member being isolated from said constant volume reservoir and connected to said first conduit means downstream of said valve means; and

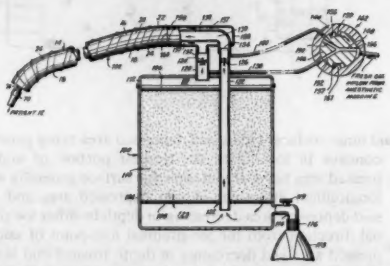
detecting and control means for detecting the volume of said variable volume member and controlling said valve means to prevent flow therethrough when a predetermined increased volume is detected and permit flow therethrough when a predetermined decreased volume is detected.

4,232,667

SINGLE LIMB BREATHING CIRCUIT ASSEMBLY AND ABSORBER

Jack Chalon, 9 Tarry Hill Rd., Tarrytown, N.Y. 10591; Sivam Ramanathan, 7100 Blvd. East, Guttenberg, N.J. 07093, and Herman Turndorf, 37 Hyatt Rd., Briar Cliff Manor, N.Y. 10510

Continuation of Ser. No. 747,910, Dec. 6, 1976, abandoned, which is a continuation-in-part of Ser. No. 568,279, Apr. 15, 1975, abandoned. This application Sep. 5, 1978, Ser. No. 939,213
Int. Cl.[3] A61M *16/00*
U.S. Cl. 128—203.26 **7 Claims**



1. A circle absorber anesthetic system for operation in conjunction with an anesthetic machine to anesthetize a patient comprising, in combination:

an absorber including a canister having an inlet end and an outlet end, means for holding a charge of exothermic water generating reacting carbon dioxide absorbent in said cannister in spaced relation with said two cannister ends whereby to define an open space at each cannister end, an inlet conduit for conveying gases exhaled by a patient extending from outside said cannister into said open space at said inlet end, an outlet conduit for conveying gases from said cannister to said patient for inhalation by said patient and extending from said open space at said outlet end through said cannister including said inlet end to outside of said cannister, said inlet and outlet conduits being disposed in said cannister for conveying exhaled gases flowing into said cannister through said inlet conduit through said carbon dioxide absorbent to the open space at the outlet end of said cannister, and therefrom through said outlet conduit to without said absorber whereby said exhaled gases are stripped in an exothermic water generating reaction with said absorbent, one way valve means in said inlet conduit permitting fluid flow therethrough only into said cannister, and one way valve means in said outlet conduit external of said cannister in heat transfer relationship with the ambient atmosphere for permitting fluid flow therethrough only out of said cannister; and

a breathing circuit assembly including a valveless inspiratory breathing tube through which the patient can inhale, a valveless expiratory tube through which the patient can exhale, said inspiratory breathing tube being connectable to said anesthetic machine and the absorber outlet conduit, said expiratory tube being connected to the inlet conduit of said absorber for absorption of exhaled carbon dioxide and reduction of anesthetic pollution of the ambient air, said inspiratory breathing tube being disposed within said expiratory tube and surrounded thereby throughout at least the respective portions of the longitudinal extents of said limbs adjacent the patient for facilitating heat retention of inhaled gases in said surrounded inspiratory breathing tube, said inspiratory and expiratory breathing tubes each comprising an end remote from said absorber, means

connected to said remote ends of said inspiratory and expiratory breathing tubes for placing said tube ends in fluid flow communication with a breathing passage of the patient, said inspiratory breathing tube remote end being disposed in close proximity to the said expiratory tube remote end to minimize dead space between said limb ends in which the exhaled gases can collect for direct rebreathing by the patient, whereby the gases exhaled by the patient into said expiratory tube will surround and heat the gases being inhaled by the patient through said inspiratory breathing tube to enable said inhaled gases to hold additional moisture and thereby reduce both the drying effects of said inhaled gases on the breathing passages of the patient and the cooling effects thereof on the patient, and whereby inhalation by the patient through said expiratory tube and exhalation by the patient into said inspiratory breathing tube will be substantially prevented to substantially prevent the rebreathing by the patient of exhaled carbon dioxide through said inspiratory breathing tube, said outlet conduit comprising means for directly and readily picking up heat from said reaction for warming said stripped gases conveyed to said inspiratory breathing tube connected to said outlet conduit open end, said warmed stripped gases being capable of holding a large amount of water vapor for return to said patient through said connected inspiratory breathing tube, whereby said exhaled gases passing through said absorber and exiting said outlet conduit for return to said patient are warmed and humidified; said one way valve means in said outlet conduit being disposed therein for enabling sufficient cooling of said warmed humidified stripped gases to permit formation of a water reservoir in said outlet conduit for maintaining a relatively constant absolute humidity for said gases to be conveyed to said connected inspiratory breathing tube; whereby both heat and moisture loss in said inhaled gases passing through said absorber for conveyance to said patient are minimized.

4,232,668

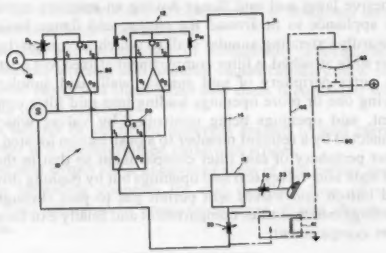
GAS VENTILATING DEVICE

John P. Strupat, #127-1560 Adelaide St., N., London, Ontario, Canada (N5X 2C1)

Filed Feb. 28, 1979, Ser. No. 15,886

Int. Cl.³ A61M *16/00*

U.S. Cl. 128—204.24 **7 Claims**



1. An apparatus for filling a fixed hollow enclosure with fluid of given volume and for evacuating the same to deliver a fixed volume of gas in successive cycles including:

(a) means for delivery of a first phase of fluid to the enclosure until the pressure therein reaches a predetermined high pressure point; and,

(b) means for delivery as a second phase a fixed volume of the fluid in the enclosure to a patient until the pressure in the enclosure reaches a predetermined low pressure point; including conveying means for conveying the fluid from the enclosure to the patient.

4,232,669

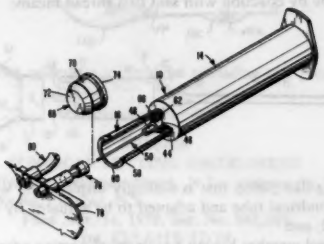
PROTECTIVE SHEATH FOR SYRINGE NEEDLE

Norman L. Nitshke, Central Square, N.Y., assignor to Bristol Myers Co., New York, N.Y.

Filed Feb. 15, 1979, Ser. No. 12,416

Int. Cl.³ A61M *5/00*

U.S. Cl. 128—218 N **5 Claims**



1. A syringe assembly including a syringe housing having a front wall substantially closing one end of the housing and hub means one said front wall for receiving and holding a syringe needle, said hub extending forwardly of said front wall and said needle having a cannula portion extending out of said hub and forwardly of said syringe housing, and a protective sheath mounted on said housing coaxially with and spaced radially outwardly from said needle for protecting said cannula portion and extending along at least a portion of the cannula portion, said sheath including:

a substantially cylindrical side wall having a longitudinal axis;

a rear wall located at and substantially closing a first rearward end of said sheath, said rear wall extending generally radially inwardly from said side wall and defining an angle with respect to said axis that corresponds to the angle of said front wall with respect to said syringe needle, whereby when said sheath is mounted on said housing said rear wall of said sheath abuts said front wall of said syringe housing throughout its corresponding radial extent;

annular flange means extending forwardly from said rear wall into said sheath, said flange means being coaxial with said side wall and defining a central aperture, said flange forming a support and alignment collar adapted to receive said hub and cannula portion and to engage said forwardly extending hub to mount said sheath on said housing so that said rear wall abuts said front wall of said housing, said collar being substantially coextensive with said hub within said sheath to provide an axial mounting that resists lateral motion of said sheath with respect to said cannula portion, said sheath being welded to said syringe housing to provide a rigid protective structure; and

removable cap means adapted to close the second, forward end of said sheath and enclose said cannula portion.

4,232,670

TUBE TYPE SUPPLY CONTAINER FOR MEDICAL SYRINGE

Karl M. Richter, Wendtorf; Hans E. Harder, Probsteierhagen, and Klaus Behrens, Rickling, all of Fed. Rep. of Germany, assignors to Howmedica International, Inc. Zweigniederlassung, Kiel, Fed. Rep. of Germany

Filed May 24, 1979, Ser. No. 42,035

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1978, 7819584[U]

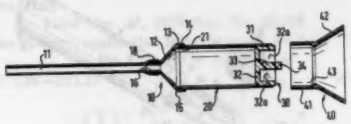
Int. Cl.³ A61M *3/00*

U.S. Cl. 128—224 **6 Claims**

1. A tube-type supply container for viscous media, in particular bone cement, that is adapted to be inserted in an appliance provided with a manually actuable push rod, said supply container comprising:

a cylindrical tube, both ends of said tube being open, one of said ends having first thread means adjacent thereto;

injection pipe means including a relatively elongated pipe portion of relatively small diameter and a conically flared portion, said pipe portion being formed of a shearable, elastic material, said conically flared portion having second thread means by which the conically flared portion can be connected to one of the ends of said cylindrical tube by coaction with said first thread means;



a plug-like piston that is sealingly displaceable within said cylindrical tube and adapted to be actuated by said push rod; and

a funnel member having a cylindrical portion adapted to be slid on the outer side of either end of said cylindrical tube and having an abutment in its interior cooperating with either end face of said cylindrical tube.

4,232,671

SAFETY EYEWASH PACKAGE AND CONTAINER THEREFOR

Charles L. Crump, 151 Fuller La., Winnetka, Ill. 60093

Filed Jun. 23, 1978, Ser. No. 918,364
Int. Cl.³ A61M 7/00
U.S. Cl. 128—249 **6 Claims**

1. A container useful for a sealed emergency safety eyewash package in which liquid, that is essentially water, is in the container, said container having a volumetric capacity of about one pint and consisting essentially of:

a front wall and a flexible rear wall constituting at least a major portion of the walls of the container; and

a removable aqueous-impervious strip of material overlying only and secured only on a central longitudinal band of the outer surface of said front wall,

said front wall being flexible to conform, when said container is sealed with water in it and after said strip has been removed, generally to the contour of an upper part of the human face, that includes the nose and both eyes,

said front wall having holes only underlying and covered only by said strip, said holes being present as two sets, each of said sets having dimensions corresponding generally to an area overlying a human eye and said sets being spaced from each other a distance such that the distance between the center of each set is about the interpupillary distance for a human,

said container when sealed and containing water and with said strip removed, being: impervious to water except at said holes; and constructed to permit movement of said rear wall toward said front wall restrained against further forward movement by the upper part of the human face,

said holes in said two sets of holes in said front wall have dimensions that, for the sealed emergency eyewash package with said strip removed, are:

sufficiently small to preclude any substantial passage of water through said holes in said front wall; and sufficiently large to provide rapid streams of water flow from said holes during the period of time that, while said holes are overlying the eyes and other portions of said front wall are being flexed by pressing said front wall against the upper part of the human face, said rear wall is moved toward said front wall,

said container further including a strap mounted on said rear wall of said container with said strap having a length so that fingers of a hand can be placed between the rear wall and the intermediate portion of said strap for manual support of said container and movement of it toward the face of the individual using the eyewash package after removal of said strip, said strap extending in a direction transverse to the direction of said strip at a plane passing through said strip between and generally equidistant from said sets of holes.

4,232,672

OSTOMY COUPLING INCLUDING A VENTING VALVE

Peter L. Steer, and John V. Edwards, both of East Grinstead, England, assignors to Kingsdown Medical Consultants Limited, London, England

Filed Aug. 2, 1978, Ser. No. 930,277
Int. Cl.³ A61F 5/44
U.S. Cl. 128—283 **6 Claims**

1. An ostomy appliance comprising a pad of polymeric material having an adhesive layer on one side and a radially extending flange permanently bonded to the other side, said adhesive layer and said flange having an aperture permitting the appliance to fit around the stoma, said flange having an upwardly extending annular wall to which an ostomy bag can be readily attached, a filter compartment affixed to a portion of the outer periphery of said annular wall, said annular wall having one or more openings leading into said filter compartment, said openings being controlled by valves which are connected by a resilient member to a push button located at the outer periphery of said filter compartment so that in the normal state said valves seal said openings but by pushing down on said button said valves will permit gas to pass through said openings into said filter compartment and finally exit from said filter compartment.

4,232,673

METHOD FOR COLLECTING AND PROCESSING BODY FLUIDS

Louis Bucalo, 155 Roberts St., Holbrook, N.Y. 11741

Filed Aug. 11, 1975, Ser. No. 603,432
Int. Cl.² A61B 10/00
U.S. Cl. 128—769 **25 Claims**

1. In a method for obtaining information pertaining to human beings or other animals having body cavities wherein fluids from which the desired information can be derived are at least temporarily present, the steps of situating at a body cavity a means responding to presence of a fluid at the body cavity for

collecting the fluid, leaving the latter means at the body cavity for a length of time sufficient to provide for collection of a quantity of fluids suitable for subsequent analysis, enclosing the collected fluid while said means remains in the body cavity in

an enclosure suitable for transmittal to a laboratory or the like where the collected fluid is to be analyzed, while preventing the collected fluid in said enclosure from flowing out of said enclosure, and then analyzing the body fluid to obtain the desired information.

4,232,674

LIQUID ABSORPTION DEVICES

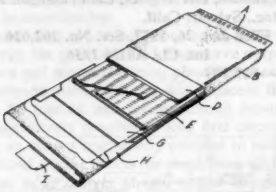
Nigel J. T. Melican, Goldington, England, assignor to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 714,466, Aug. 16, 1976, abandoned. This application Dec. 5, 1978, Ser. No. 966,692

Claims priority, application United Kingdom, Aug. 22, 1975, 34974/75

Int. Cl.³ A61F *13/16*

U.S. Cl. 128—287 **17 Claims**



1. A liquid absorbent device comprising: an absorbent layer, said absorbent layer consisting of:

(a) at least one carrier sheet of substantially non-absorbent material, wherein said material causes capillary flow of a liquid along said sheet when said sheet is contacted with said liquid; carrying

(b) a deposit of absorbent materials applied to said carrier sheet in a predetermined pattern of stripes;

wherein said stripes leave uncovered areas of said carrier sheet thereby providing channels for said capillary flow of said liquid from saturated to unsaturated areas of said absorbent material.

4,232,675

MALE CONTRACEPTIVE ARRANGEMENT

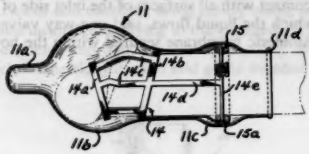
Edward N. Meldahl, 230 W. 55th St., Apt. 11D, New York, N.Y. 10019

Filed Mar. 29, 1979, Ser. No. 24,782

Int. Cl.³ A61F *5/42*

U.S. Cl. 128—294 **14 Claims**

1. A male contraceptive arrangement received by a penis comprising a condom having a rim surrounding an entry end and an enlargement proximate said entry end, a resilient retaining cover overlying said rim, and a spermicide receiving member disposed within said condom beneath said enlargement



serving both operative spermicidal extruding and positioning purposes.

4,232,676

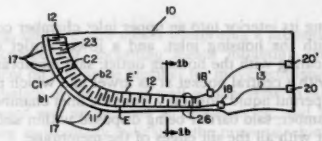
SURGICAL CUTTING INSTRUMENT

Andrew Herczog, Hammondsport, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Nov. 16, 1978, Ser. No. 961,192

Int. Cl.³ A61B *17/39*

U.S. Cl. 128—303.14 **7 Claims**



1. A surgical instrument adapted to be coupled to a source of electrical power for cauterizing tissue which is moist and electrically conductive due to the presence of physiological fluid and for simultaneous hemostasis thereof, the instrument comprising:

a blade, a cutting edge formed integrally with said blade along an edge thereof for incising tissue, and at least one pair of electrically-conductive electrodes disposed in the vicinity of the cutting edge in spaced relation to each other and adapted to be electrically coupled to the source of power, each electrode formed as an electrically conductive film surface on the blade surface including a common current carrying member evenly spaced from the cutting edge and integral transverse elongated narrow fingers extending therefrom being relatively closely interdigitated with fingers of another of said electrodes, a distal end of each of said fingers for an electrode being located on the same blade surface as the common current carrying member for the other electrode to conduct electrical power along a plurality of electrical current paths transversely from one finger to an immediately adjacent interdigitated finger for directly heating the tissue along the cutting edge in response to the electrical power applied thereto; and

connection means on said instrument providing electrical connections to said electrodes for supplying the electrical power thereto.

4,232,677

MICROBE-BARRIER DRAINAGE DEVICE

Saul Leibinsohn, 11 Oley Hagardom, Rishon Lezion, Israel

Filed May 22, 1978, Ser. No. 908,279

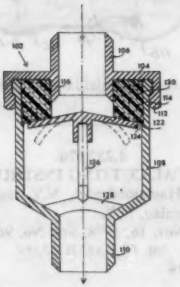
Claims priority, application Israel, Jun. 7, 1977, 52266

Int. Cl.³ A61F *5/44*; A61M *27/00*

U.S. Cl. 128—350 R **5 Claims**

1. A microbe barrier device particularly useful for draining body liquids while avoiding retrograde infection, comprising: a housing including an inlet connectable to a liquid line and an outlet through which the liquid from the line is drained; a one-way valve within the housing between its inlet and outlet

and permitting the one-way flow of the liquid only from the inlet to the outlet; and a barrier within the housing between its inlet and the one-way valve and including an antiseptic substance in contact with all surfaces of the inlet side of the valve through which the liquid flows, said one-way valve comprising an elastomeric membrane secured within the housing and



partitioning its interior into an upper inlet chamber communicating with the housing inlet, and a lower outlet chamber communicating with the housing outlet; said membrane being formed with a central pocket at its lower end which pocket is slitted to permit liquid flow only from the inlet chamber to the outlet chamber; said barrier being disposed within said pocket in contact with all the slit edges of the membrane.

4,232,678

DEVICE FOR THE LOCAL TREATMENT OF A PATIENT, AND MORE PARTICULARLY APPLICABLE IN ACUPUNCTURE AND AURICULOTHERAPHY

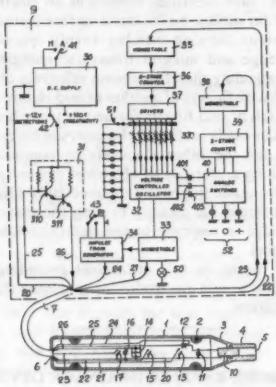
Joseph Skovajsa, 19, Avenue Vauquelin, 93 Coubron, France

Filed May 15, 1978, Ser. No. 905,938

Claims priority, application France, May 16, 1977, 77 14907; Aug. 1, 1977, 77 23616

Int. Cl.³ A61N *5/00*

U.S. Cl. 128—395 **3 Claims**



1. A device for point-treatment of a patient, comprising a treatment head, a power supply unit, and a flexible connection therebetween, at least one laser diode carried by said treatment head, said treatment head comprising a body of generally cylindrical form, which terminates in a truncated portion, said truncated portion carrying a short cylindrical portion of smaller diameter than the diameter of said cylindrical body, said short cylindrical portion having an interior surface for defining a treatment orifice for selectively receiving said laser diode and an exterior surface for defining a mounting surface for mounting a separate end piece for selectively receiving said laser diode, and laser control energizing means located within said treatment head for controlling the laser diode, so that said diode emits laser pulses of light, said supply unit including means for applying trains of electric pulses to said laser control energizing means recurrently and in a controlled manner, said energizing means comprising a capacitor and a thyristor arranged in series circuit relationship with said laser diode, said supply unit including means connected across the capacitor and capable of charging the same, while electric pulses are applied to the control gate of said thyristor, the power supply unit including means for furnishing the laser diode with two different D.C. voltages, the lower voltage serving for detection purposes without considerable laser stimulation, the stronger voltage serving for the treatment with laser pulses, the power supply unit including means for switching a frequency parameter of said electric pulses, cyclically among a predetermined plurality of frequency values, and wherein the treatment head carries a first manual switch means for controlling energization of said laser diode, said treatment head also carrying a second manual switch means for controlling said cyclic switching of the frequency parameter, said means for switching a frequency parameter including a first generator in the supply unit, the basic recurrence frequency of the first generator being switchable among a plurality of selected frequencies, including means for adjusting the frequency parameter, step by step correction control means in said supply unit for effecting said adjustment of the frequency parameter, and wherein said treatment head includes a third manual switch means for actuating said step by step correction control means.

4,232,679

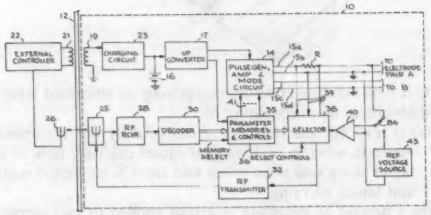
PROGRAMMABLE HUMAN TISSUE STIMULATOR

Joseph H. Schulman, Los Angeles, Calif., assignor to Pacesetter Systems, Inc., Sylmar, Calif.

Filed Jan. 26, 1977, Ser. No. 762,626

Int. Cl.³ A61N *1/36*

U.S. Cl. 128—419 PG **35 Claims**



1. A programmable human tissue stimulator system comprising:

an implanted stimulating signal generator for generating body tissue stimulating pulses responsive to control signals,

an implanted memory means for storing control signals for controlling said stimulating signal generator,

external control means for generating a plurality of sets of signals, each set including control signals, and signals which represent a memory address in said memory means,

external means for transmitting said generated sets of signals;

an implanted receiver for receiving said sets of transmitted signals,

implanted means for verifying that the received signals in each set are accurate and for producing an accurate signal when each signal in a set has substantially either a first waveform or a second waveform,

an implanted memory address means for storing the memory

address which is represented by the memory address representing signal in the set;

implanted means responsive to said accurate signal for entering selected ones of the received control signals in each set in the memory means at the memory address stored in said memory address means, and

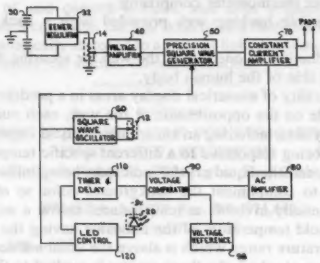
implanted means for controlling said implanted stimulating signal generator with control signals from said memory.

4,232,680

APPARATUS AND METHOD FOR TRANSCUTANEOUS ELECTROTHERAPY NERVE STIMULATOR

Bruce D. Hudleson, 2920 Ivy St., Titusville, Fla. 32780, and Joachim F. Mahnke, 75 Alhambra Dr., Merritt Island, Fla. 32952

Filed May 16, 1978, Ser. No. 906,696
Int. Cl.[2] A61N *1/36*
U.S. Cl. 128—422 **22 Claims**



1. An electrotherapy apparatus for electrically treating a section of the patient's body, said electrotherapy apparatus comprising in combination:

first circuit means operatively coupled to a source of electrical energy for generating a squarewave output signal;

at least two pad means for being placed in operative electrical communication with the skin adjacent the body section to be treated; and second circuit means having an input operatively coupled to said first circuit means and having an output operatively coupled to said pad means, said second circuit means for amplifying said squarewave signal so as to deliver at said output thereof a constant current squarewave output signal representative of said squarewave signal at the input thereof, with said second circuit means further including current regulator means for holding constant the current level of said constant current squarewave output signal independent of the operative resistance of the body section between said pad means, whereby the area of the body operatively interposed between said pad means will be treated by said constant current squarewave output signal having a predetermined constant current level.

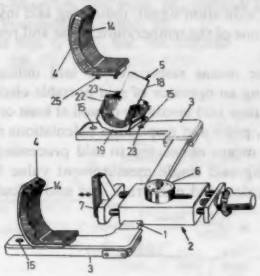
4,232,681

LEG POSITIONING DEVICE FOR X-RAY FILMING

Olaf Tulaszewski, Friedrich-Ebert-Str. 25, 6103 Griesheim near Darmstadt, Fed. Rep. of Germany

Filed Oct. 30, 1978, Ser. No. 955,962
Claims priority, application Fed. Rep. of Germany, May 16, 1978, 2821251
Int. Cl.[3] A61B *6/00*
U.S. Cl. 128—653 **13 Claims**

1. A leg positioning device for X-ray filming, comprising supporting means, including an elongated guide member, a pair of laterally projecting outriggers mounted on respective end portions of said guide member for sliding movement lengthwise thereof, and a plurality of leg-engaging and retaining elements on the respective outriggers, so that a leg engaged by said elements extends lengthwise of said guide member from one to the other of said outriggers, said elements comprising one member for engaging and retaining a foot of the leg, and a pair of members for engaging and retaining the leg above the foot, any two of said members being jointly usable at one time; and pressure means for applying to the engaged leg intermediate said elements reproducible pressure acting in direction transversely of the elongation of said guide member and hence



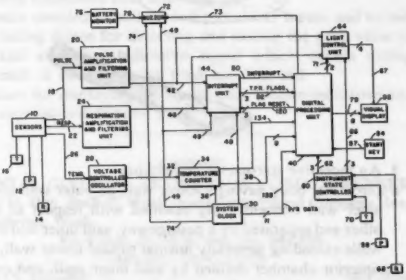
of the leg, said pressure means comprising a pressure-exerting pusher component, mounting means mounting said pusher component on said guide member for movement lengthwise of the elongation of the same as well as transverse to said elongation toward and away from an engaged leg, and means for measuring and visually indicating the pressure which is being exerted by said pusher component upon the leg.

4,232,682

PHYSIOLOGICAL PARAMETER MEASURING SYSTEM

George J. Veth, Fairfield, Conn., assignor to United States Surgical Corporation, Norwalk, Conn.

Continuation of Ser. No. 769,887, Feb. 18, 1977, abandoned.
This application Aug. 21, 1978, Ser. No. 935,642
Int. Cl.[3] A61B *5/02*
U.S. Cl. 128—671 **9 Claims**



1. A portable electronic apparatus capable of being transported to, and successively and rapidly servicing, individually a plurality of patients by simultaneously measuring temperature, pulse rate, and respiration rate for each successive patient, comprising:

a plurality of sensing means for measuring said temperature, pulse and respiration, respectively, and each simultaneously providing a signal corresponding to said temperature, pulse, and respiration, respectively;

converting means for receiving and converting said signals corresponding to said temperature, pulse and respiration, respectively, to produce corresponding digital data signals, said corresponding digital data signals including a series of measurement values leading to a single measurement value;

processing means for receiving and processing said corresponding digital data signals so as to calculate said single measurement value for temperature before said single measurement value for temperature is reached, and so as to calculate a pulse rate and a respiration rate, and for determining, by analysis of said corresponding digital data signals, invalidity of at least one of the temperature, pulse and respiration calculations, said processing means generating indication signals indicating said invalidity of said at least one of the temperature, pulse and respiration calculations;

indicator means responsive to said indication signals for alerting an operator of said portable electronic apparatus each time said invalidity of said at least one of the temperature, pulse and respiration calculations is indicated; and

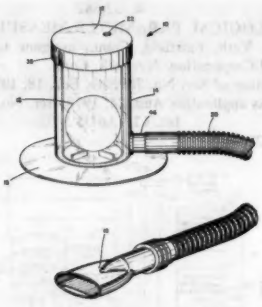
display means connected to said processing means for displaying said single measurement value for temperature, said calculated pulse rate, and said calculated respiration rate.

4,232,683

THERAPEUTIC INCENTIVE SPIROMETER

Victor L. Bartholomew, Hemet, Calif., and Harold R. Havstad, Eagle Point, Oreg., assignors to Hudson Oxygen Therapy Sales Company, Temecula, Calif.

Filed Jul. 17, 1978, Ser. No. 924,919
Int. Cl.³ A61B *5/08*; A63B *23/00*
U.S. Cl. 128—725 **21 Claims**



1. An incentive spirometer comprising

a spirometer body having a lower wall, an outer wall and an inner wall concentrically oriented with respect to each other and separated by a passageway, said inner and outer walls extending generally normal to said lower wall,

an interior chamber defined by said inner wall, and cover means overlying said passageway and interior chamber,

gas inlet means for directing gas downwardly into said chamber,

passage means for directing gas out of said chamber, across said inner wall and into said passageway,

gas outlet means for directing gas out of said passageway, through said outer wall to the exterior thereof,

by-pass control means movably secured on said body and cooperating with said outer wall,

a closable by-pass gas opening defined by said by-pass control means cooperating with said outer wall through which gas from the exterior enters said passageway, and wherein the size of said opening is varied as said by-pass control means is moved on said body, and

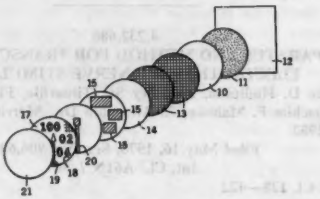
visual means associated with said interior chamber for indicating the rate of gas flow through said chamber.

4,232,684

FEVER THERMOMETER

Melvin Chervitz, c/o E. Z. Temp, Inc., P.O. Box 27505, St. Louis, Mo. 63141

Filed Jul. 14, 1978, Ser. No. 924,507
Int. Cl.³ A61B *10/00*
U.S. Cl. 128—736 **1 Claim**



1. A fever thermometer comprising:

(a) a flexible backing web provided with a background color,

(b) an adhesive on one side of the web for securing the web to the skin of the human body,

(c) a plurality of numerical display areas in a predetermined attitude on the opposite side of the web, each numerical display area including an encapsulated liquid crystal indicator being responsive to a different specific temperature range, and the liquid crystal indicators being initially of a color to compliment the background color so as to be substantially invisible at temperatures below a minimum threshold temperature of the indicator having the lowest temperature range which is above the usual ambient temperature at which the thermometer is applied to the skin,

(d) a directional indicator on the said opposite side of the web for enabling adherence of the web with the numerical display areas in the predetermined attitude when the numerical display areas are substantially invisible at the usual ambient temperatures below the minimum threshold temperature when the thermometer is applied to the skin so that the numerical display areas can be easily read when made visible at temperatures within the responsive temperature ranges of the liquid crystal indicators after the thermometer is applied to the skin,

(e) a mask overlying the liquid crystal indicators, the mask having substantially the same color as the background color, and the mask being provided with windows disposed over and exposing the liquid crystal indicators to provide the numerical display areas, and

(f) the directional indicator is provided by:

(1) a window in the mask, and

(2) means providing a color contrasting with the background color located behind and visible through the directional indicator window.

4,232,685

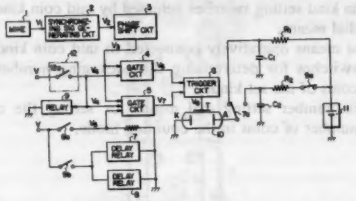
LARYNX STROBOSCOPE FOR PHOTOGRAPHY

Hironobu Nagashima, Tokyo; Koji Tuda, and Masatoshi Marui, both of Kami Fukuoka, all of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 14, 1978, Ser. No. 960,543
Claims priority, application Japan, Nov. 14, 1977, 52-136435
Int. Cl.³ A61B *1/04, 1/06*
U.S. Cl. 128—773 **11 Claims**

1. In a larynx stroboscope adaptable for use with a camera for photographing a larynx the improvement comprising, means to generate a larynx vibration signal, a flash discharge tube having an anode and a cathode and selectively connected to a photographing charge discharge capacitor by the release operation of a camera, circuit means connected to said capacitor for precharging said capacitor during observation, means responsive to said release operation for disconnecting said capacitor from said circuit means, and for reconnecting said

capacitor to said circuit means after the light emission of said flash discharge tube, whereby said capacitor is immediately ready for photographic operation upon said release operation, means to apply a trigger pulse to a trigger terminal of said flash discharge tube in synchronization with a vocal cord vibration



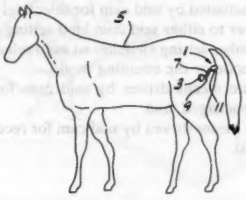
signal, wherein said flash discharge tube emits light while the shutter of said camera is open, and after a photographing operation is complete, the functions of said flash discharge tube are automatically restored to a state of light emission for observation before the shutter release operation.

4,232,686

METHOD AND APPARATUS FOR INDICATING THE ONSET OF PARTURITION

William G. Kammlade, Jr., 703 Taylor Dr., Carbondale, Ill. 62901

Filed Feb. 2, 1978, Ser. No. 874,464
Int. Cl.³ A61B *5/10*
U.S. Cl. 128—775 **8 Claims**



1. Apparatus for indicating at a distance the onset of parturition in animals comprising:

a radio transmitter and a source of electrical power adapted to be secured to the pre-parturient animal at a position some distance from the vaginal orifice of said animal;

a rupturable assembly adapted to be mounted across the vaginal orifice of the pre-parturient animal and having a preferred rupture line so that when the vaginal orifice distends during the onset of parturition the assembly ruptures along the preferred rupture line; connecting means for connecting the transmitter to the source of electrical power, said means including a switch disposed intermediate the transmitter and the source of electrical power which switch when closed completes a circuit therebetween, thereby causing power to be supplied to the transmitter, said switch being secured to the rupturable assembly on one side of the preferred rupture line;

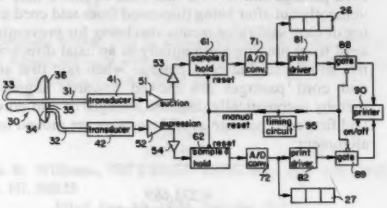
means for preventing the switch from completing a circuit between the transmitter and the source of electrical power while the rupturable assembly is unruptured, said preventing means being secured to the rupturable assembly adjacent the switch but on the opposite side of the preferred rupture line from the switch, the state of said switch except when it is proximate said preventing means being such as to complete the circuit between the transmitter and the source of electrical power, whereby at the onset of parturition the rupturable assembly ruptures, separating the switch from the preventing means, thereby completing a circuit between the transmitter and the source of electrical power, causing the transmitter to transmit a radio signal indicative of the onset of parturition.

4,232,687

APPARATUS AND METHOD FOR DETERMINING NEWBORN INFANT FEEDING CAPABILITY

Gene C. Anderson-Shanklin, Oak Park, Ill., assignor to University of Illinois Foundation, Urbana, Ill.

Filed Sep. 1, 1977, Ser. No. 829,623
Int. Cl.³ A61B *5/00, 5/10*
U.S. Cl. 128—777 **5 Claims**



1. Apparatus for recording parameters which are determinative of an infant's capability of taking oral nourishment safely, comprising:

a test nipple;

first and second transducer means adapted for coupling to said nipple, said first transducer means being operative to generate a suction-indicative electrical signal and said second transducer means being operative to generate an expression-indicative electrical signal;

timing means for defining successive time intervals of predetermined duration;

means coupled to said first transducer means and to said timing means for detecting and storing the peak value of said suction-indicative signal which occurs during each of said successive time intervals;

means coupled to said second transducer means and to said timing means for detecting and storing the peak value of said expression-indicative signal which occurs during each of said successive time intervals; and

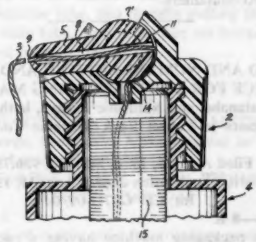
means for displaying the stored peak suction-indicative and expression-indicative signal values.

4,232,688

DENTAL GINGIVAL RETRACTION CORD DISPENSER

Reed H. Day, Bothell, Wash., assignor to Pascal Company, Inc., Bellevue, Wash.

Filed Sep. 26, 1978, Ser. No. 945,830
Int. Cl.³ A61C *15/00*
U.S. Cl. 132—91 **10 Claims**



1. A cord dispensing device comprising:

a first cord dispensing means defining a first cord passage passing completely therethrough, said first cord dispensing means having a curved surface portion;

a second cord dispensing means defining a second cord passage passing completely therethrough, wherein said first and second cord dispensing means are held in a movable relation with respect to each other; and

a cord threaded through said first and second cord passages; wherein said second cord dispensing means includes ridge means for pinching said cord against said curved surface portion of the first cord dispensing means when said first and second cord passages are nonaligned, to prevent inadvertant retraction of said cord through said second cord passage and to hold said cord so that it may be conveniently cut after being dispensed from said cord dispensing device; said ridge means also being for preventing said cord from moving substantially in an axial direction relative to said second cord passage when said first and second cord passages are moved towards alignment to thereby automatically dispense a length of said cord from said first cord passage as said passages are moved towards alignment.

4,232,689

COIN DISPENSER

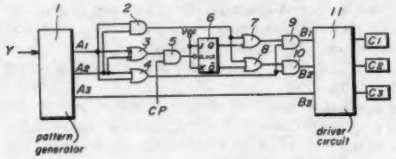
Takakazu Nagasaka, Nara, and Yasuhide Nakamura, Yamatokoriyama, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Nov. 2, 1978, Ser. No. 957,104

Claims priority, application Japan, Nov. 5, 1977, 52-150065

Int. Cl.³ G07D *1/00*; B65H *3/44*

U.S. Cl. 133—4 A **7 Claims**



1. A control system for a coin dispenser including a plurality of containers, at least two of said containers containing coins of a same kind; a pattern generator for developing container selection signals in response to a coin dispensation amount signal applied thereto; and a drive means for selecting desired containers in accordance with the container selection signals derived from said pattern generator, said control system comprising:

digital logic switching means operatively connected between said pattern generator and said drive means for sequentially selecting one of said at least two containers in response to said container selection signals derived from said pattern generator, said logic switching means uniformly dispensing said coins of the same kind from said at least two containers.

4,232,690

COIN KIND AND NUMBER SETTING AND ADJUSTING DEVICE FOR COIN PACKAGING MACHINE

Kenkichi Watanabe, and Katusuke Furuya, both of Tokyo, Japan, assignors to Laurel Bank Machine Co., Ltd., Tokyo, Japan

Filed Aug. 25, 1978, Ser. No. 936,787

Claims priority, application Japan, Aug. 31, 1977, 52-105360

Int. Cl.³ G07D *09/04*

U.S. Cl. 133—8 R **1 Claim**

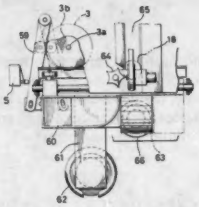
1. A coin packaging machine having a packaging mode, wherein a specific kind of coins is selected, a relatively small packaging number of coins being determined in accordance with the specific kind of coins and the determined number of coins being packaged, said machine having a counting mode, wherein a relatively large number of coins is counted, comprising:

coin kind setting dial means for setting a kind of coins in the packaging mode,

coin kind setting switches actuated by said coin kind setting dial means,

first means operatively connected to said coin kind setting switches for determining the packaging number of the coins of the set kind,

coin number setting dial means for setting the counting number of coins in the counting mode,



coin number setting switches actuated by said coin number setting dial means,

second means operatively connected to said coin number setting switches for determining the counting number of coins,

a cam provided on said coin number setting dial,

switch means actuated by said cam for selectively supplying electric power to either said coin kind setting switches or said coin number setting switches so as to select either the packaging mode or the counting mode,

packaging chute means driven by said cam for receiving coins to be packaged, and

counting chute means driven by said cam for receiving coins to be counted.

4,232,691

PROCESSING OF SHEET MATERIAL IN A LIQUID BATH

Sidney Grant, 46 Salmon St., Kingsbury, London N.W.9, England

Filed Feb. 5, 1979, Ser. No. 9,353

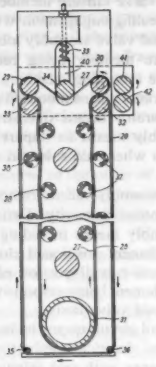
Claims priority, application United Kingdom, Feb. 7, 1978, 4916/78

Int. Cl.³ G03D *3/12*

U.S. Cl. 134—104 **10 Claims**

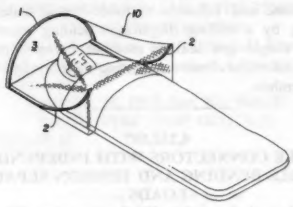
1. Apparatus for processing sheet material in a bath of liquid comprising a container for the liquid, a pair of drivable endless bands, means driving said bands and means mounting the bands to receive the sheet material between the bands, hold the material between the bands to transport the material through the container, and deliver the material from between the bands after immersion in the liquid, wherein at least one of the bands is composed of permeable material to allow access of liquid to the side of the sheet material in contact with the permeable band and guide members are mounted in the container to extend transverse to the bands and engage the outer faces of the bands, said bands passing between said guide members, wherein the permeable band is composed of a synthetic fabric

and the guide members are scraper bars positioned for defining a sinuous path for the bands, said scraper bars having edges



which engage the outer faces of the bands and serve to move liquid through the permeable band and scrape dirt therefrom.

4,232,692
CANOPY FRAME
Philip A. Atkins, Rte. 2, Box 801, Chico, Calif. 95926
Filed Dec. 22, 1978, Ser. No. 972,401
Int. Cl.[3] A47C *29/00*
U.S. Cl. 135—5.1 5 Claims



1. A canopy frame for supporting a netting or the like comprising in combination:

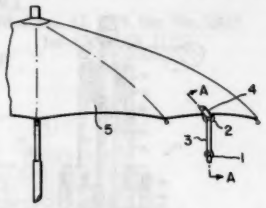
a substantially "U" shaped frame member in which terminal portions of legs of said "U" shaped frame member are spaced apart and said "U" shaped element lies totally in one plane,

a pair of spaced parallel elements having substantially flat portions connected orthogonally to said terminal portions of said "U" shaped frame, thereby adapted to serve as a support base,

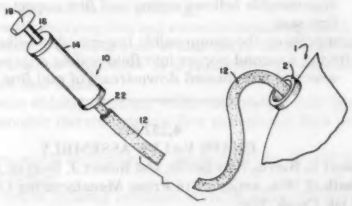
said spaced parallel coextensive elements each terminating in an arcuate portion, curved so as to extend in a same direction as said U shaped member, whereby end areas of said arcuate portions never are interbraced and each end area is equidistant from an axis of symmetry of said U shaped frame member.

4,232,693
FOLDING UMBRELLA
Toshio Matsuda, 4-7 Miyamaecho Sanjo, Nara-shi, Nara-ken, Japan
Filed Oct. 27, 1978, Ser. No. 955,484
Claims priority, application Japan, Oct. 28, 1977, 52-129958
Int. Cl.[3] A45B *25/18*
U.S. Cl. 135—36 F 2 Claims

1. A folding umbrella comprising a collapsible central shaft, a movable frame consisting of foldable ribs coupled to one end of the shaft, an unfurlable material coupled to the foldable ribs, a guide mounted on the edge of said material such that said guide loops around an edge of the material and a belt swingingly coupled at one end to said guide whereby the umbrella may be furled not only when the umbrella is folded up but also when the umbrella is not folded up.



4,232,694
SIPHON
Francis R. Williams, 500 Lunalilo Home Rd., Apt. 16F, Honolulu, Hi. 96825
Filed Jan. 19, 1979, Ser. No. 4,772
Int. Cl.[3] F04F *10/00*
U.S. Cl. 137—1 9 Claims



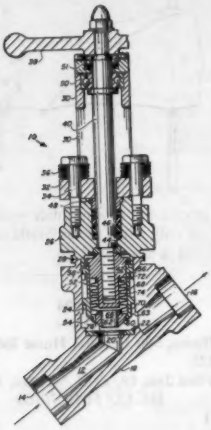
9. A siphoning method comprising inserting a distal end of an elongated main tube in a tank containing fluid to be siphoned, positioning a connector tube in a proximal end of the main tube, the connector tube having a distal end within the main tube and having a proximal end extending from the proximal end of the main tube connecting to the connector tube, connecting to the connector tube an evacuating pump having a cylinder with an inlet end by inserting a nipple connected to the inlet end of the cylinder into the proximal end of the connector tube, positioning a piston within the cylinder near the inlet end and connecting a plunger to the piston and extending the plunger out of a second end of the cylinder remote from the inlet end, pulling outward on a handle on an end of the plunger remote from the piston and creating a reduced pressure within the cylinder and thereby within the nipple, within the connection tube and within the main tube, contacting a second end of the cylinder with the plunger and continuing pulling outward on the handle and pulling on the cylinder, nipple and connector tube, and thereby pulling the connector tube from the main tube, permitting free unobstructed flow of a siphoned fluid from the main tube.

4,232,695
FLUID CONTROL VALVE AND METHOD
Frank L. Roberge, Scottsdale, Ariz., assignor to The Garrett Corporation, Los Angeles, Calif.
Filed Dec. 18, 1978, Ser. No. 970,714
Int. Cl.[2] F16K *1/44*
U.S. Cl. 137—1 31 Claims

1. A method of reduntantly interrupting pressurized fluid flow through a duct, comprising the following steps occurring sequentially in response to movement of a single actuator:

driving a first poppet into fluid sealing engagement with a first seat, said first poppet being driven by the actuator through a compressible, impermeable bellows;

generating a fluid pressure differential on said compressible



impermeable bellows urging said first poppet toward said first seat;

compressing the compressible impermeable bellows; and

driving a second poppet into fluid sealing engagement with a second seat located downstream of said first seat.

4,232,696

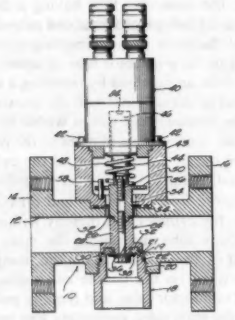
DRAIN VALVE ASSEMBLY

Robert E. Burris, New Berlin, and Robert J. Budyak, Greendale, both of Wis., assignors to Prime Manufacturing Corporation, Oak Creek, Wis.

Filed Oct. 3, 1977, Ser. No. 838,754

Int. Cl.[3] E03B *7/10*; F16K *31/04*

U.S. Cl. 137—62 **3 Claims**



1. A drain valve assembly for a fluid system comprising:

a valve body having a flow passageway therein and fluid connector means for establishing fluid connection between said flow passageway and a fluid system, said flow passageway of said valve body having a thermally conductive wall portion, said valve body further having a thermostat mounting cavity therein located opposite said thermally conductive wall portion;

a drain assembly means including a drain port mounted in the lower portion of said valve body, said drain assembly means including a stationary valve seat surrounding said drain port;

a valve assembly means mounted for reciprocal movement in said valve body passageway towards and away from said stationary valve seat, said valve assembly means including a valve closure member adapted to move into and out of sealing engagement with said stationary valve seat when said valve assembly means is reciprocated, said valve closure member being removably mounted in a valve closure mounting member;

a solenoid operator means mounted on said valve body, said solenoid operator means operatively connected to said valve assembly means to impart a reciprocating movement thereto when said solenoid operator means is energized;

a thermostat assembly means removably mounted in said thermostat mounting cavity of said valve body, said thermostat assembly means including a temperature sensing thermostat element positioned closely adjacent said thermally conductive wall portion of said valve body, said thermostat element being responsive to the temperature of the fluid in said valve body;

electrical control circuit means including a source of electrical energy and electrical conductor means connecting said source of energy with said solenoid operator means and said thermostat assembly means, said electrical control circuit means operative so that when the temperature of said temperature sensing element of said thermostat assembly means reaches a predetermined minimum, said solenoid operator means will be energized to move said valve assembly means from its closed position to its open position; and

said valve assembly further including an actuator member extending through an opening in the upper portion of said valve body, said actuator member interconnecting said valve closure mounting member with said solenoid operator means, said actuator member being sealed in said opening by a rolling diaphragm sealing member, said rolling diaphragm sealing member being captured between said valve closure mounting member and said actuator member.

4,232,697

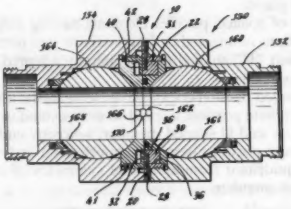
FRANGIBLE CONNECTORS WITH INDEPENDENTLY SELECTABLE BENDING AND TENSION SEPARATION LOADS

Daniel T. Meisenheimer, Jr., 404 Longmeadow Rd., Orange, Conn. 06477

Filed Apr. 26, 1978, Ser. No. 900,329

Int. Cl.[3] F16K *17/40*

U.S. Cl. 137—68 R **26 Claims**



1. A frangible connector insert for frangibly connecting two members comprising:

(A) a tension ring secured to one of the members, the tension ring having an axially disposed surface and defining a plurality of radially disposed openings intersecting the axially disposed surface;

(B) a moment arm ring having an axially disposed surface and a radially disposed surface, the moment arm ring closely received by the tension ring to create an axial interface between their respective axially disposed sur-

faces, the moment arm ring defining an opening aligned with each opening in the tension ring;

(C) tension-mode frangible means disposed in the openings in the tension ring and extending across said axial interface between the tension ring and the moment arm ring into moment arm ring, the tension-mode frangible means holding the tension ring and moment arm ring together, the tension-mode frangible means shearing upon application of a tension load of sufficient magnitude to permit the tension ring and the moment arm ring and the members connected thereto to separate;

(D) a bending ring secured to the other of the members, the bending ring having a radially disposed surface for interfacing with the radially disposed surface of the moment arm ring; and

(E) bending-mode releasable means connecting the bending ring and the moment arm ring and thereby holding the members together, the bending-mode releasable means releasing upon application of a bending load of sufficient magnitude to permit the bending ring and moment arm ring and the members respectively connected thereto to separate

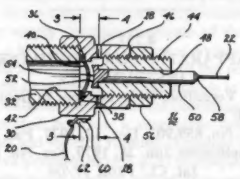
whereby when tension loads are applied, the tension-mode frangible means shear to permit the members to separate, and when bending loads are applied, the bending-mode releasable means release to permit the members to separate, wherein the magnitude of the tension-mode separating load and the bending-mode separating load are independently selectable.

4,232,698

PRESSURE RELIEF VALVE WITH PRESSURE INDICATING MEANS

Craig Hosterman, Scottsdale, and William J. Kerwin, Tucson, both of Ariz., assignors to Products of Advanced Technology, Inc., Phoenix, Ariz.

Filed Sep. 28, 1978, Ser. No. 946,627
Int. Cl.³ F16K *17/40*; G01L *9/12*
U.S. Cl. 137—68 R **11 Claims**



1. A pressure relief valve apparatus operatively attached to a high pressure cylinder for providing an indication of the pressure within the cylinder, said apparatus comprising in combination:

a. impedance means disposed within the pressure relief valve for providing an impedance representative of the pressure within the cylinder, said impedance means comprising a capacitor and including a flexible disc flexibly responsive to the pressure within the cylinder, said disc being electrically coupled as a positionable plate of said capacitor, said disc being rupturable in the event of a pressure rise within the cylinder above a predetermined value;

(b) an end plate disposed in proximity to said disc in fixed relationship thereto, said end plate being electrically coupled as a fixed plate of said capacitor; and

(c) means for sensing the impedance and providing an indication reflective of the pressure within the cylinder;

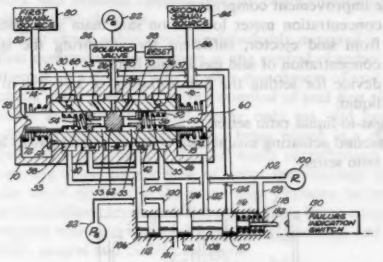
whereby, movement of said disc relative to said end plate varies the impedance of said capacitor.

4,232,699

HYDRO-MECHANICAL FAILURE DETECTION AND LATCHING APPARATUS

William W. Hsu, Burbank, Calif., assignor to Textron Inc., Providence, R.I.

Filed Jan. 12, 1979, Ser. No. 2,827
Int. Cl.³ F16K *31/12*
U.S. Cl. 137—87 **7 Claims**



1. Hydromechanical failure detection and latching apparatus comprising:

(A) a housing;

(B) a sleeve defining a bore longitudinally therethrough and slidably disposed in said housing;

(C) means for applying first and second pressure signals to be monitored to opposite ends of said sleeve for causing said sleeve to slide responsive to a predetermined difference between said signals;

(D) a piston slidably disposed within said bore in said sleeve and movable therein between first and second limit positions;

(E) spring means centering said piston centrally of said bore in said sleeve;

(F) said piston defining reentrant bores at each end thereof and separated by a central portion of said piston;

(G) a source of fluid under pressure; and

(H) passageway means for communicating said fluid pressure from said source through one of said reentrant bores to an end area of said piston responsive to sliding of said sleeve, said central portion of said piston normally blocking said passageway means, said piston moving to one of its said limit positions responsive to application of said source of fluid pressure to an end of said piston.

4,232,700

METERING DEVICE

Iokhannes I. Sutt, ulitsa Vyistluse, 23/25, kv. 69, Tallin, U.S.S.R.

Filed Jul. 21, 1978, Ser. No. 926,817
Claims priority, application U.S.S.R., Jan. 17, 1978, 2562096
Int. Cl.³ G05D *11/08*
U.S. Cl. 137—93 **11 Claims**

1. In a metering device determining and controlling the content of a gas in a liquid fed through a main, comprising:

an ejector for mixing said gas with said liquid, hydraulically associated with said main;

a first actuating mechanism;

a gas flow controller coupled to said first actuating mechanism;

a vacuum diaphragm valve coupled to said gas flow controller and pneumatically associated with said ejector;

a line for feeding said gas;

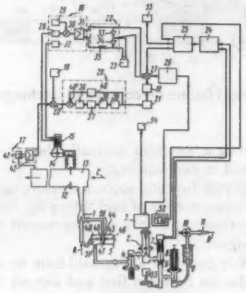
a gas pressure controller located on said gas feed line;

a first differential inductive pickup;

a rotameter coupled to said first differential inductive pickup for measuring the flow rate of said gas;

said rotameter being coupled to said gas flow controller and to said gas pressure controller;

a restricting means arranged in said main;
a second differential inductive pickup;
a first converter;
a differential pressure gauge hydraulically associated with said restricting means and coupled to said second differential inductive pickup;
said restricting means, said differential pressure gauge, said second differential inductive pickup, and said first converter comprising a liquid flow meter;
the improvement comprising:
a concentration meter located on said main at a distance, from said ejector, sufficient for measuring the steady concentration of said gas in said liquid;
a device for setting the concentration of said gas in said liquid;
a gas-to-liquid ratio setter;
a second actuating mechanism coupled to said gas-to-liquid ratio setter;



an electronic gas-to-liquid ratio setter correction controller coupled to said device for setting the concentration of said gas in said liquid, coupled to said concentration meter, and coupled, via said second actuating mechanism, to said gas-to-liquid ratio setter;
a liquid flow meter;
a first signal distributor coupled to said first converter and to said liquid flow meter;
a second signal distributor;
a second converter coupled to said first differential inductive pickup and to said second signal distributor;
an electronic gas-to-liquid flow ratio controller connected between said gas-to-liquid ratio setter and first said actuating mechanism, and coupled to said first and second signal distributors; and
a pilot-operated check value connected between said ejector and said vacuum diaphragm valve.

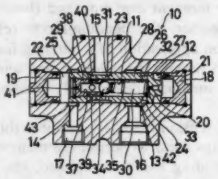
4,232,701

FLOW DIVIDER VALVE

Yoshiharu Adachi, Gamagori, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Apr. 24, 1979, Ser. No. 32,890
Claims priority, application Japan, Apr. 25, 1978, 53-48852
Int. Cl.[3] G05D *11/03*
U.S. Cl. 137—101 **13 Claims**

1. A valve for dividing the flow of a fluid having a variable flow volume into two flows of said fluid having a substantially constant ratio of flow volumes, comprising:
(a) a body having a cylindrical bore, an inlet port, and first and second outlet ports;
(b) a valve spool axially slidably disposed in said cylindrical bore and dividing said cylindrical bore into first and second chambers;
(c) first passage means for flow of said fluid between said inlet port and said first chamber, and between said inlet port and said first outlet port, including:
(1) a first variable orifice formed by cooperation of the cylindrical bore of said body and said valve spool, the opening of said first variable orifice being varied by axial movement of said spool within said cylindrical bore; and
(2) a first orifice between said inlet port and said first variable orifice;
(d) second passage means for flow of said fluid between said inlet port and said second chamber and between said inlet port and said second outlet port, including:
(1) a second variable orifice formed by cooperation of the cylindrical bore of said body and said valve spool, the opening of said second variable orifice being varied by



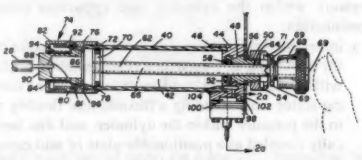
axial movement of said spool within said cylindrical bore; and
(2) a second orifice between said inlet port and said second variable orifice;
(e) the fluid pressure in said first and second chambers being proportional to the pressure of said fluid at said inlet port and acting on respective opposite ends of said valve spool for axial translation of said valve spool in said cylindrical bore for varying the openings of said first and second variable orifices; and
(f) normally closed valve means subjected to the difference between fluid pressure at said inlet port and fluid pressure in said first chamber for permitting, at a predetermined value of said pressure difference, fluid flow from said second passage means for increasing fluid flow through said first outlet port.

4,232,702

PRIMING APPARATUS FOR LIQUID INK WRITING INSTRUMENTS

Ronald J. Geil, Vermilion, Ohio, assignor to Gould Inc., Rolling Meadows, Ill.

Division of Ser. No. 859,902, Dec. 12, 1977, Pat. No. 4,170,016.
This application Jun. 28, 1979, Ser. No. 52,810
Int. Cl.[3] F16K *17/04*
U.S. Cl. 137—115 **1 Claim**



1. An improved pressure relief valve, comprising:
a housing having an inlet opening and a pressure relief opening;
a piston slidably located in said housing wherein said pressure relief opening is axially aligned with said piston and said piston extends loosely through said pressure relief opening;
means for biasing said piston toward said inlet opening;

seal means between said piston and said housing for normally preventing fluid flow therebetween;

passage means located in said piston for connecting inlet pressure to said pressure relief opening upon movement of said piston through a predetermined distance against the action of said biasing means; and

an outlet passage through said piston.

4,232,703

SAFETY CLOSE-OFF VALVE ARRANGEMENT FOR PIPE CONDUIT SYSTEMS AND INSTALLATIONS

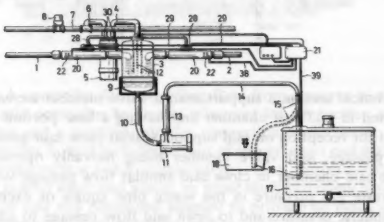
Antonio M. Celi, Neustadt, Fed. Rep. of Germany, assignor to Karl W. Wiegand, Hennef, Fed. Rep. of Germany

Filed Dec. 21, 1977, Ser. No. 862,820

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1976, 26583619

Int. Cl.³ F16K *31/00*

U.S. Cl. 137—172 **5 Claims**



1. A safety arrangement for separating liquids including milk, extraneous water and cleansing medium, for use with a system including a first running container, two supply conduits located upstream of the first running container and supplying the liquid into the latter, a negative pressure device connected with the first running container, an automatic cleansing device operative with the cleansing medium, a pump located downstream of and conveying the liquids from the first running container, and separate receiving means for receiving the respective liquids, the arrangement comprising sensing means operative for sensing characteristics of the different liquids and including two first sensing elements each located in a respective one of the supply conduits upstream of the first running container, and a second sensing element located downstream of the pump and immediately upstream of the receiving means so as to sense the characteristic of the liquids at these substantially spaced locations; closing means including two close-off valves each located between a respective one of said first sensing elements and the first running container and connected with the negative pressure device so as to operate by the latter; and common electronic control means arranged to electronically connect said sensing means with said closing means so as to actuate the latter in response to sensing of characteristics of the liquids by said sensing means.

4,232,704

IN LINE BACK FLOW PREVENTER

Bernard S. Becker, Belmont; John K. Bowman, Brighton, and Cyril A. Randall, Belmont, all of Mass., assignors to Amtrol Inc., West Warwick, R.I.

Filed Mar. 28, 1978, Ser. No. 890,964

Int. Cl.³ F16K *15/06, 45/00*

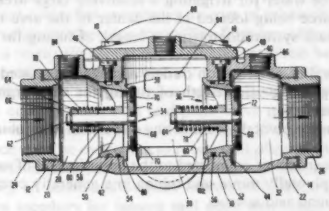
U.S. Cl. 137—218 **17 Claims**

1. A device for preventing the back flow of water from a point of use into a water supply line comprising:

(a) a unitary casing having a water inlet opening, a water outlet opening, a drain vent inlet opening, and a removal opening, said water inlet and water outlet openings being coaxially aligned, the interior of said casing defining an inlet chamber, a central chamber, an outlet chamber, a first communicating passage between the inlet chamber and the central chamber and a second communicating passage between the central chamber and the outlet chamber, said chambers being coaxially aligned with each other and with said water inlet and water outlet openings to form a straight through flow path for the water, said interior of said casing also defining a drain vent chamber communicating with said drain vent opening and said central chamber, said drain vent chamber being offset from said coaxially aligned inlet, central and outlet chambers, said removal opening directly communicating with said central chamber;

(b) a first check valve assembly detachably mounted in said first communicating passage at the central chamber end thereof, in a manner which, after detachment of said first check valve assembly, allows removal of said first check valve assembly from said casing only via said central chamber, said first check valve being biased in a closed position to prevent the flow of water therethrough and opening to permit the flow of water therethrough when the water pressure in the water inlet chamber exceeds a predetermined level, said first check valve being coaxially aligned with said water inlet and outlet openings and said inlet, central and outlet chambers;

(c) a second check valve assembly detachably mounted in said second communicating passage at the central chamber end thereof, in a manner which, after detachment of said second check valve assembly, allows removal of said second check valve assembly from said casing only via said central chamber, said second check valve being biased in a closed position to prevent flow of water therethrough when the water pressure in said central chamber exceeds a predetermined level, said second check valve being coaxially aligned with said water inlet and outlet openings and said inlet, central and outlet chambers;



(d) a relief valve located within said casing interposed between said central chamber and said drain vent chamber, said relief valve being biased in an open position, said relief valve being offset from said coaxially aligned inlet, central and outlet chambers;

(e) a flexible diaphragm attached to said casing and to said relief valve, one side of said diaphragm communicating with said central chamber and with said drain vent opening, said central chamber communicating with said drain vent opening by a communicating route, including a valve seat passage, through said relief valve, the other side of said diaphragm communicating with said inlet chamber, said relief valve having an element which closes said valve seat passage when there is a pressure differential between said inlet and central chambers caused by flow of water from said inlet chamber into said central chamber through said first communicating passage, thereby preventing water flow from said central chamber to said drain vent chamber, said valve seat passage being open when said pressure differential is not present; and

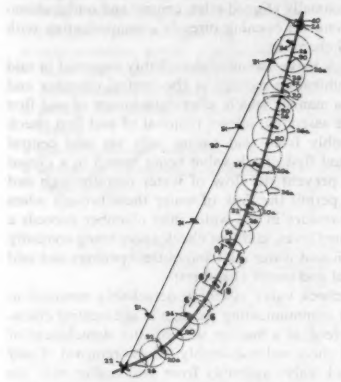
(f) a cover removably attached to said casing over said removal opening therein, said first and second check valve assemblies being removable from said central chamber without removal of said flexible diaphragm when said cover is detached.

4,232,705

AUTOMATIC ROTARY IRRIGATION SYSTEM

James M. Hait, San Jose, Calif., assignor to FMC Corporation, San Jose, Calif.

Filed May 5, 1978, Ser. No. 903,320
Int. Cl.³ B05B *3/00*
U.S. Cl. 137—899.1 **10 Claims**



1. An automatic rotary irrigation system for connection to a source of water for irrigating a relatively large area of land, said source being located at the center of the area to be irrigated, said system comprising a length of tubing for carrying water;

a plurality of irrigation outlets arranged in spaced relationship along said length of tubing for discharging water therefrom;

means for pivotally connecting one end of said tubing to said source;

a power mover connected to the opposite end of said tubing to pivotally move said tubing in a generally circular path around said source;

means for supporting said tubing at spaced points along the length thereof and for permitting it to traverse said area when said power mover moves said tubing;

control means for intermittently actuating said power mover, said control means including valve means for interrupting the flow of water from said source to said tubing, drain means for draining the water from said tubing, said drain means being responsive to said valve means to drain said tubing in response to the interruption of said flow in said tubing, a timing mechanism which periodically actuates said valve means according to a predetermining schedule, said control means actuating said power mover for a predetermined amount of time corresponding to a desired angular advance only while said valve means is actuated so that said tubing will be substantially empty of water when it is moved about said source.

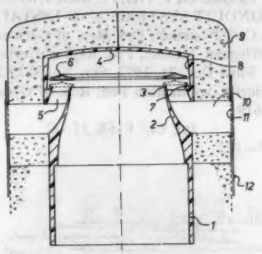
4,232,706

AUTOMATIC VALVE DEVICE FOR SANITATION WASTE PIPES

Kurt S. B. Ericson, Goudenregenlaan, 17, B-2610 Wilrijk, Belgium

Filed Aug. 31, 1978, Ser. No. 938,337
Claims priority, application Belgium, Aug. 31, 1977, 858265
Int. Cl.³ E03C *1/295*
U.S. Cl. 137—375 **8 Claims**

1. An automatic valve device connectable to a sanitation waste pipe for preventing discharge of waste gas from the pipe to the atmosphere and for admitting atmospheric air into the waste pipe in response to a pressure reduction in the waste pipe, which comprises a tubular member having an open bore extending therethrough with an upper conical section which tapers inwardly and upwardly, a cylindrical cover member overlying said upper conical section having a top wall spaced above the upper end of said conical section to form a valve seat chamber and an interior wall having an inwardly extending portion spaced radially from at least part of the upper portion of said conical member to form an annular flow passage therebetween communicating with the valve seat chamber, said inwardly extending portion defining with the upper edge of



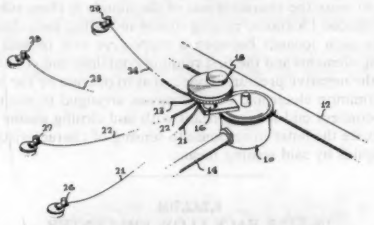
said conical section a support seat, a valve member movably mounted in said seat chamber and having a base portion designed for reception on said support seat to close said annular flow passage, said valve member being movably operative within said chamber to close said annular flow passage when the waste gas pressure in the waste pipe equals or exceeds atmospheric pressure and to open said flow passage to admit atmospheric air to the waste pipe when the waste gas pressure in the waste pipe is less than atmospheric pressure.

4,232,707

CONTROLLER FOR FLUID FLOW SYSTEMS

Oded E. Sturman, and Benjamin Grill, both of Northridge, Calif., assignors to Hydronic Systems, Inc, Woodland Hills, Calif.

Filed Jul. 25, 1978, Ser. No. 927,942
Int. Cl.³ G05B *11/01*
U.S. Cl. 137—624.2 **7 Claims**



1. A fluid flow controller comprising:

a timing circuit which generates watering duration signals at predetermined intervals;

a cascade terminal; and

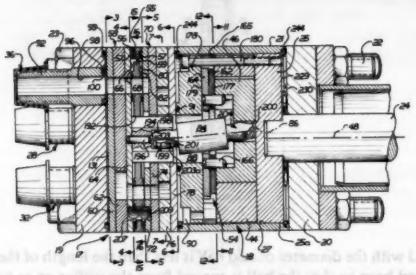
a stepper and control circuit having output terminals, and responsive to a pulse on said cascade terminal for generating an "on" pulse on a first output to turn on a valve, and responsive to signals from said timing circuit after generation of the "on" pulse to generate off and on control pulses on other outputs including an "off" pulse on said first output to turn off the valve and an "on" pulse on a second output to turn on a second valve, and an "off" pulse on the second output to turn off the second valve.

4,232,708

FLUID CONTROLLER

Laurence L. Miller, West Lafayette, Ind., assignor to TRW Inc., Cleveland, Ohio

Filed Jun. 25, 1979, Ser. No. 51,795
Int. Cl.[3] F15B 13/04, 13/10, 13/14
U.S. Cl. 137—625.21 17 Claims



1. A controller for controlling flow from a source to a motor, said controller having an inlet port for connection to the source and a working port for connection to the motor, said controller further including a pair of spaced apart end plates, a metering section and a control valve section disposed between said spaced apart end plates, an input shaft extending through one of said end plates and adapted to provide an input signal for operating said metering section and said control valve section, said control valve section comprising a plurality of adjacent plate valve members fixed between said spaced apart end plates, said plurality of fixed plate valve members defining a fluid chamber in fluid communication with said inlet port, the outer periphery of said plurality of fixed plate valve members, the outer periphery of a part of said metering section and the outer periphery of said end plates forming a part of the outer periphery of said controller, a movable plate valve member disposed in said fluid chamber, said movable plate valve member being movable in response to the input signal from a neutral condition to an operating condition for directing fluid from said inlet port to said metering section and from said metering section to said working port to direct metered flow to the motor.

10. A controller for controlling fluid flow from a source to a motor, said controller having an inlet port for connection to the source, a return port for connection to a reservoir, and a pair of working ports for connection to opposite sides of the motor, said controller further including a metering section and a control valve comprising a pair of relatively rotatable plate valve members having facing end surfaces in sliding abutting relation with each other, said plate valve members having a neutral condition blocking flow from the inlet port to the metering section and being rotatable away from said neutral condition to an operating condition to form flow passages directing metered flow to the motor through one working port and return flow from the motor to the reservoir through the other working port, a pressure dam groove disposed in the facing end surface of one of said relatively rotatable plate valve members, said pressure dam groove communicating with said return port when said plate valve members are in said neutral condition and disposed so as to be positioned between flow passages at metered fluid pressure and flow passages at return pressure when the plate valve members are rotated to an operating condition, the abutting facing end surfaces of said relatively rotatable plate valve members cooperating to block flow from the inlet port through the pressure dam groove to the return port when the plate valve members are in the neutral condition and to form a static body of fluid in said pressure dam groove in response to movement of said plate valve members to an operating condition, and fluid passage means in the facing end surface of the other plate valve member defining part of a fluid passage communicating said static body of fluid in said pressure dam groove with said inlet port in response to movement of said plate valve members to said operating condition to bring the pressure in said pressure dam groove to inlet pressure in order to minimize leakage of metered fluid to the return port.

11. A controller for controlling fluid flow from a source to a primary motor and to an auxiliary motor, said controller comprising a metering section for metering fluid flow in response to an input signal and a control valve section for directing fluid flow to the auxiliary motor and to the primary motor in response to said input signal, said control valve section comprising a series of adjacent plate valve members, said series of plate valve members being biased to a neutral condition and being relatively movable away from said neutral condition to place said controller in an operating condition, means for effecting relative movement of said plate valve members in response to said input signal to position said plate valve members in said operating condition, said plate valve members defining fluid passages for directing all flow from the source to the auxiliary motor when said plate valve members are in said neutral condition, said plate valve members defining other fluid passages for directing a flow of fluid from the source to said metering section and from said metering section to the primary motor when said plate valve members are in an operating condition, and said plate valve members having relatively movable surfaces which cooperate to restrict flow to the auxiliary motor as a function of the extent of the relative movement of the plate valve members away from said neutral condition.

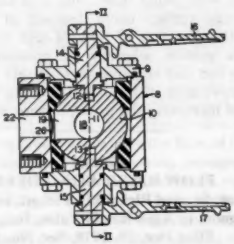
14. A controller for controlling fluid flow from a source to a motor, said controller comprising a series of relatively rotatable plate valve members for controlling flow to said hydraulic motor, said relatively rotatable plate valve members having a neutral condition and being relatively rotatable away from said neutral condition to an operating condition, first biasing means exerting a centering force on said plate valve members when said plate valve members are in said neutral condition and which force must be overcome to rotate said plate valve members away from said neutral condition, second biasing means for exerting an additional amount of centering force on said plate valve members for biasing said plate valve members to said neutral condition in response to a predetermined amount of relative rotation of said plate valve members away from said neutral condition.

4,232,709

FOUR-WAY BALL VALVE

Michael T. Zoric, N. Versailles, Pa., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Oct. 20, 1978, Ser. No. 953,146
Int. Cl.[3] F16K 11/087
U.S. Cl. 137—625.47 3 Claims



1. A four-way ball type valve device for selectively controlling communication between two or more ports formed therein, said valve device comprising:

(a) a casing having at least three ports connectable to respective pipes;

(b) a ball-shaped valve member having a first passageway extending diametrically therethrough and a branch passageway normal to and intersecting said first passageway, said valve member being rotatably disposed in said casing and selectively operable to a plurality of positions in each of which positions fluid pressure is communicated between two or more of said ports via said passageways in said valve member; and

(c) a sealing element sealingly disposed between said casing and said valve member and having at least three openings therein registering with said ports in the casing, said sealing element having an inner surface contour complementing the outer surface of the ball-shaped valve member and providing sufficient clearance therebetween for permitting snug rotating action of the valve member therein and sufficient displacement thereof, responsively to fluid pressure in said passageways, for applying sealing pressure of the valve member against the cut-off port when only two of said ports are in communication with each other.

4,232,710

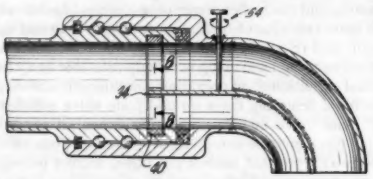
LIQUID PIPELINE EXTENDED VANE ELBOW

Donald J. Gallo, Whippany; Thomas L. Roscetti, Rockaway; Alan E. Emslie, Mountainside, all of N.J., and Frederick G. Hammitt, Ann Arbor, Mich., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Feb. 2, 1979, Ser. No. 8,874

Int. Cl.³ F15D *1/04*

U.S. Cl. 138—39 **10 Claims**



1. A passage for flow of liquid therethrough comprising at least a curved pipe elbow section and an adjacent upstream straight pipe section adapted for receiving liquid flow in a direction from said straight section to said elbow section, at least a single curved vane mounted in said passage of said curved pipe elbow section at a predetermined constant radius, said vane having a main surface extending between the sides of said passage and extending lengthwise in a curved configuration corresponding to that of said curved pipe elbow section beyond the end of said curved pipe elbow section into said straight pipe section for a predetermined distance and having a leading edge which has an aerodynamic configuration that will not interfere with liquid flow, only said extended portion of said vane main surface being disposed at a negative angle relative to the direction of flow of said liquid through said straight pipe section, whereby the combination of said extended vane and said negative angle of said vane substantially suppresses cavitation of the liquid flowing through said passage without increasing the back pressure in said passage.

4,232,711

FLOW REGULATING DEVICE

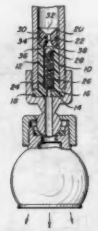
Robert T. Ray, Sr., and Richard G. Pickett, both of Wilmington, Del., assignors to Aqua-Retain Valve, Inc., Wilmington, Del.

Filed Dec. 29, 1978, Ser. No. 139

Int. Cl.³ F15D *1/06*

U.S. Cl. 138—44 **5 Claims**

1. A flow regulator comprised of a cylindrical housing adapted to be inserted into a water line, said housing being closed at one end thereof having an opening therethrough, said housing having a first bore adjacent the other end, said housing having a second bore extending from the inner end of said first bore to the closed end of said housing, a plug positioned in said first bore, said plug having an orifice therethrough and flow restricting means comprised of a spring and ball in said second bore whereby said orifice and said restricting means regulate the flow of water therethrough, the length of said spring combined with the diameter of said ball is less than the length of the second bore so that the ball is spaced from the orifice so as to reduce the turbulence in the water emerging from said orifice, and the diameter of said second bore is substantially constant throughout the length thereof so that the volume of water emerging from said second bore is substantially the same for all positions of said ball within said bore.



4,232,712

HEAT-RECOVERABLE ARTICLES

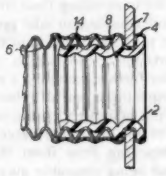
David T. Squires, Swindon, England, assignor to Raychem Limited, London, England

Filed Sep. 25, 1978, Ser. No. 945,299

Claims priority, application United Kingdom, Sep. 30, 1977, 40791/77

Int. Cl.³ F16L *47/00*

U.S. Cl. 138—109 **20 Claims**



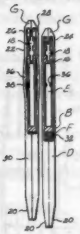
1. An article for attaching an elongate member to a wall at an aperture in the wall, the article comprising an inner sleeve, having both first and second ends open, and secured thereto an outer sleeve having first and second ends, the second end of the outer sleeve being open, at least a portion of the section of the outer sleeve between the second end of the outer sleeve and where the outer sleeve is secured to the inner sleeve being heat-shrinkable and extending over and being spaced apart from a portion only of the length of the inner sleeve, thus forming a securing part of the article for securing the elongate member to the article, at least a portion of the inner sleeve remote from the securing part of the article being heat-expansible, thus forming an attachment part of the article adapted to be passed through the aperture and when heated to expand to attach the article to the wall.

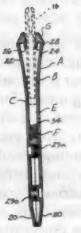
4,232,713

HEDDLE FRAME NOSE GUIDE

Frank H. Kaufmann, and Charles F. Kramer, both of Greenville, S.C., assignors to Steel Heddle Manufacturing Company, Greenville, S.C.

Filed Apr. 23, 1979, Ser. No. 32,656
Int. Cl.[3] D03C 9/06
U.S. Cl. 139—91 4 Claims





1. A nose guide device for maintaining adjacent heddle frames of a weaving loom separated during shedding wherein each heddle frame includes top and bottom frame slats having a longitudinal open-top groove formed along a side edge thereof, said nose guide device comprising:

spaced elongated front and back sides;

side edge means joining and spacing said front and back sides;

said side edge means terminating short of the length of said front and back sides defining opposing open side edge portions and a corresponding open transverse slot extending therebetween for receiving a frame slat;

biasing means carried intermediate said front and back sides extending into said open transverse slot for engaging said frame slat;

one end of said front and back sides terminating in a tapered end portion defining a nose for separating adjacent heddle frames;

said front and back sides being split from one another at an opposing end thereof defining first and second free end portions bendable away from one another for straddling and receiving said frame slat therethrough to engage said biasing means; and

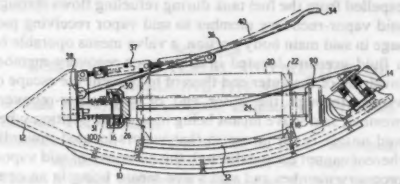
opposing hook portions formed adjacent the ends of said first and second free end portions for engaging in said open-top groove of said frame slat when said frame slat is received in said transverse slot and urged outwardly by said biasing means.

4,232,714

TRAVELING YARN DISPENSERS

Andrew K. Clokie, Dewsbury, England, assignor to Greenbat, Limited, Leeds, England

Filed Dec. 20, 1978, Ser. No. 971,524
Claims priority, application United Kingdom, Dec. 21, 1977, 53361/77
Int. Cl.[2] D03D 51/34
U.S. Cl. 139—371 6 Claims



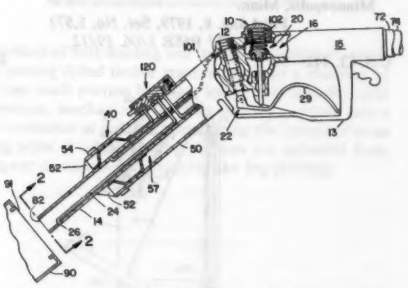
1. A traveling yarn dispenser for use in a textile machine comprising a body, means for mounting a yarn carrier within said body for rotation about the longitudinal axis of the yarn carrier, and an electric generator having a rotor, said rotor being driven from rotation of the yarn carrier.

4,232,715

COAXIAL VAPOR RECOVERY NOZZLE

Walter R. Pyle, Richmond, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Dec. 28, 1978, Ser. No. 974,190
Int. Cl.[3] B65B 3/18
U.S. Cl. 141—1 25 Claims



1. A vapor-recovery system for vehicle refueling wherein a fuel-dispensing system cooperates with portions of a vehicle fuel receiving and storage system, comprising:

a fuel-dispensing nozzle having a main body portion, a discharge spout projecting from the main body portion, said discharge spout having an outlet end proportioned for ease of insertion into a fuel tank fillpipe of a vehicle fuel receiving and storage system, a flow passage for the flow of fuel to said nozzle and through said main body portion and said discharge spout, a flow control valve in said main body portion operable to regulate the flow of fuel through said flow passage, a vapor-receiving passage formed in said main body portion, a vapor-recovery, rigid, tubular member projecting from said main body portion and coaxially arranged around said discharge spout to define with the exterior surface of said discharge spout a vapor-recovery passageway therebetween for receiving vapors displaced from the vehicle fuel tank during refueling, said vapor-recovery member having an inner end and outer end, the inner end of said vapor-recovery member mounted on said main body portion and communicating with said vapor receiving-passage in said main body por-

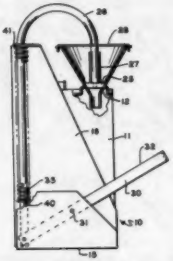
tion, the outer end of said vapor-recovery member located rearwardly of the outlet end of said discharge spout and proportioned for ease of insertion into the fuel tank fillpipe, a seal means located inwardly of the fuel tank fillpipe opening for receiving the outlet end of said discharge spout and the outer end of said vapor-recovery member to establish a vapor-tight seal with said vapor-recovery member when said discharge spout is operatively inserted in the fuel tank fillpipe so that substantially all the vapor expelled from the fuel tank during refueling flows through said vapor-recovery member to said vapor receiving passage in said main body portion, a valve means operable by a fluid pressure located in said vapor-recovery member inwardly of the outer end thereof to prevent the escape of vapors through the outer end of said vapor-recovery member, said valve means being in a closed position when said nozzle is not in use so that vapors located inwardly thereof cannot escape through the outer end of said vapor-recovery member and said valve means being in an open position when said nozzle is operatively inserted into the fuel tank fillpipe and said seal means sealingly engages said vapor-recovery member so that vapor expelled from the fuel tank during refueling may be directed through said vapor-recovery member to the vapor-receiving passage in said main body portion, and an actuating means for operating said valve means so that said valve means is closed when said nozzle is not in use and so that said valve means is open when said nozzle is operatively inserted into the fuel tank fillpipe and said seal means sealingly engages said vapor-recovery member.

4,232,716

WASTE SOLVENT COLLECTOR

Bob B. White, St. Petersburg, Fla., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jan. 8, 1979, Ser. No. 1,572
Int. Cl.³ B65B *3/06, 39/12*
U.S. Cl. 141—98 **5 Claims**



1. An apparatus for collection of liquid into a container having a top opening, said apparatus comprising:

a support structure including a base for supporting said container, a funnel having an upper end with an opening for receiving fluid, and a lower end for insertion into said top opening of said container, the outside contour of the funnel being complimentary to the geometry of said top opening of said container such that as the funnel is lowered it comes to rest on the rim of said top opening and produces a seal between the funnel and the container;

a closure member positioned inside said funnel for opening and closing a fluid passage through said funnel; and

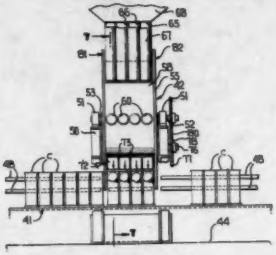
means, mounted on said support structure, operable to engage said closure member and said funnel for opening said closure member to allow passage of fluid through the funnel and simultaneously lifting the funnel from said top opening of said container through a sufficient distance to provide a clearance between said funnel and said container and thus allow venting of the container while fluid is poured through said funnel.

4,232,717

TENNIS BALL CAN FILLER

Joseph M. Allgaier, Chicago; Jack W. Richens, Naperville, and Rajendra K. Leekha, Glendale Heights, all of Ill., assignors to The Continental Group, Inc., New York, N.Y.

Filed Dec. 21, 1978, Ser. No. 972,157
Int. Cl.³ B65B *1/04*
U.S. Cl. 141—179 **10 Claims**



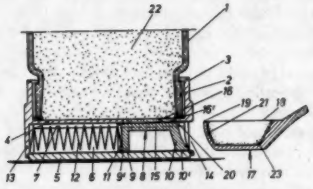
5. A filling apparatus for simultaneously filling plural containers, said apparatus comprising product supply means, dispensing means, and container positioning means, said container positioning means including means for sequentially positioning a series of containers adjacent said dispensing means for individually receiving products from said dispensing means, and said dispensing means including means for receiving products from said product supply and dispensing said products to containers of a positioned series of containers in timed relation to the positioning of such containers, said container positioning means including an endless conveyor support for supporting containers while engaged by said means for sequentially positioning said series of containers and for delivering containers to said means for sequentially positioning series of containers, said means for sequentially positioning series of containers being in the form of vanes extending transversely of said conveyor.

4,232,718

DEVICE FOR THE PORTIONED REMOVAL OF GRANULES

Gerhard Wippermann, Boerholz 72, 4057 Brüggen 2, Fed. Rep. of Germany

Filed Nov. 7, 1978, Ser. No. 958,400
Claims priority, application Fed. Rep. of Germany, Nov. 8, 1977, 2749831; Jun. 1, 1978, 2824016
Int. Cl.² B65B *1/06*
U.S. Cl. 141—358 **13 Claims**



1. A device for the dosed removal of granules from storage containers, particularly household packages of coffee, tea or the like, comprising

a storage container comprising,

a bottom wall defining a discharge opening,

means defining a channel under said bottom wall, said chan-

nel opening toward a transverse side of said storage container,

a closure slider slidably disposed in said channel,

a spoon adapted to be pushed into said channel, said spoon being shaped complementarily to the cross-section of said channel, said spoon forming a trough having an edge spanning a larger surface than that of said discharge opening, said spoon having a front face edge abuttingly pressing back said closure slider when said spoon is inserted in said channel,

said closure slider being adapted to be pressed back against spring action, said closure slider being formed with a front surface,

said front face edge of said spoon being shaped to the shape of said front surface of said closure slider,

said bottom wall defines at least one prechamber above said discharge opening,

at least one division wall connected with said closure slider,

said at least one prechamber is covered by said at least one division wall in a closing position of said closure slider.

4,232,719

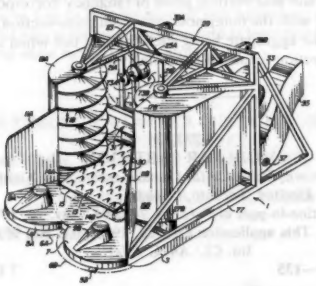
BRUSH HARVESTER

Robert E. Payton, P.O. Box 25424, Phoenix, Ariz. 85002

Filed Apr. 23, 1979, Ser. No. 32,128

Int. Cl.³ A01G *23/08*

U.S. Cl. 144—34 R **13 Claims**



1. An apparatus for clearing vegetation, including brushwood and small trees, and producing chips therefrom, said apparatus comprising in combination:

a. horizontal cutting means disposed along a front end of said vegetation clearing apparatus for severing vegetation including brushwood, trees and the like as said vegetation clearing apparatus moves forward;

b. conveyer means for receiving severed vegetation as said vegetation clearing apparatus moves forward, said conveyer means having an inlet end and an outlet end, said conveyer means conveying the severed vegetation from said inlet end to said outlet end;

c. compacting means for forcing severed vegetation downward against said conveyer means to effect rearward movement of said vegetation by said conveyer means;

d. chopping means for receiving severed vegetation from the outlet end of said conveyer means and chopping the vegetation into chips and;

e. output means for receiving the chips from said chopping means and exhausting the chips into a container wherein said conveying means includes a continuous belt-like conveying element for engaging the severed vegetation and conveying the severed vegetation toward the outlet end, said conveyer means also including a pair of pulley-like roller elements for powering said conveying element to cause the upper portion of said conveying element to move from the inlet end to the outlet end of said conveyer means.

4,232,720

ROUND LOG MATERIAL AND METHOD OF PRODUCING THE SAME

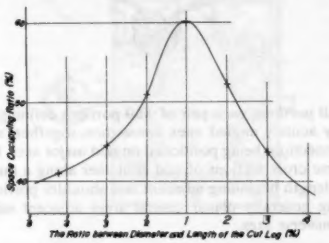
Morimasa Hanaya, Kure, Japan, assignor to Toyo Pulp Co., Limited, Tokyo, Japan

Continuation of Ser. No. 487,508, Jul. 11, 1974, abandoned. This application Nov. 19, 1976, Ser. No. 743,378

Claims priority, application Japan, Aug. 4, 1973, 48-87848

Int. Cl.³ A01G *23/08*

U.S. Cl. 144—309 AC **13 Claims**



1. A method of bulk loading and transporting timber, which includes cutting felled timber transversely into a plurality of log portions, each portion having a length substantially equal to its diameter, mechanically loading said log portions into a transport container at random, transporting the container to an unloading point at which the log portions are unloaded from the transport container, and chipping the log portions.

4,232,721

COLLAPSIBLE SOLUTION CONTAINER HAVING RECTANGULAR SHOULDER

Jerry D. Martin, Highland Park; Stephen J. Pearson, Ingleside; Gary A. Ward, Round Lake, all of Ill., and David A. Winchell, Twin Lakes, Wis., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Apr. 9, 1979, Ser. No. 28,151

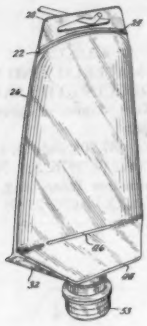
Int. Cl.³ B65D *1/02*

U.S. Cl. 150—0.5 **36 Claims**

1. In a molded, collapsible solution container, which container defines a chamber-defining body portion wall having an integral neck portion and a shoulder portion at one end thereof and defining, in its normal, unstressed state, a transverse cross-section which tapers from said shoulder portion progressively along a major portion of its length to a flat, sealed end portion at the end of the container opposite to said one end, the improvement comprising, in combination:

said shoulder portion being rectangular in shape, the wall circumferences of said transverse cross-sections progressively decreasing in length along said container from

adjacent said shoulder portion toward said opposite end, in which the transverse cross-sections of said container along the majority of its length beginning adjacent said shoulder portion exhibit mutually perpendicular major and minor transverse axes, said major axes being longer than the minor axes, and two pairs of outwardly-angled

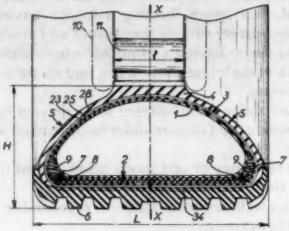


wall portions, each pair of wall portions defining a generally acutely angled apex connection together, said apex connections being positioned on said major axes, the transverse cross sections of said container along a majority of its length beginning adjacent said shoulder portion exhibiting generally planar central areas adjacent said minor transverse axes.

4,232,722
Patent Not Issued For This Number

4,232,723
ISOSTABLE TUBULAR TIRE
Georges Gazuit, Montlucon, France, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Oct. 10, 1978, Ser. No. 949,449
Int. Cl.³ B60C *5/12, 9/20*
U.S. Cl. 152—350 **15 Claims**

1. A tubular tire for motor vehicles of the type including an inflatable inner tube, a casing of the radial type, a reinforcement in addition to the casing in the ground contacting area, a rim strip, some rubber sides, a tire tread and two semi-rigid circular rods set at the level of the reinforcement at the edges thereof characterized by the fact that the rim strip has a width included between approximately 0.25 L and approximately 0.35 L, wherein L represents the total width of the tire tread, by the fact that the transverse section of the tire has in a known manner an H over L ratio which is included between 0.5 and 0.6 wherein H represents the total height between the rim strip and the tire tread, and by the fact that seen in transverse section

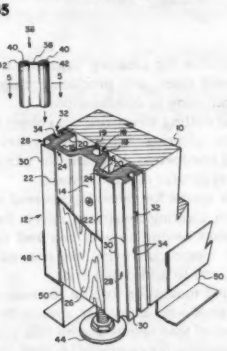


each side of the tire has a profile corresponding to a curve described by the equation:

$$x = \int_y^a \frac{y^2 - b^2}{y\sqrt{(a^2 - b^2)^2 - (y^2 - b^2)^2}} \cdot dy$$

which is substantially included between two points wherein the tangents are respectively vertical at y approximately equal to b and horizontal at y approximately equal to a, said approximately horizontal point of tangency corresponding substantially with the intersection of the tire vertical section centerline and the rim and said vertical point of tangency corresponding substantially with the outermost maximum cross-section width of the tire, the aggregate being such that the tire when seen in transverse section forms an isostable system.

4,232,724
MODULAR PARTITION
Mortimer Brown, Terra Cotta, Canada, assignor to Nightingale Industries Limited, Toronto, Canada
Continuation-in-part of Ser. No. 745,001, Nov. 26, 1976, abandoned. This application Oct. 23, 1978, Ser. No. 953,870
Int. Cl.² A47G *5/00*
U.S. Cl. 160—135 **7 Claims**



1. A modular partition panel wall of the type in which a panel is adapted to be associated with at least one other such panel to provide a self supporting free standing wall, and comprising at least two said panels, each of said panels having;

a generally rectangular panel body portion having top and bottom edges and upright end edges at each end thereof having front and back faces;

end connector members fastened along each said end edge of said panel extending from top to bottom thereof; and each said connector member having side edges coterminous with said front and back panel faces, and having inner and outer faces;

a median recess formed in said outer face of each said connector member intermediate said side edges for reception of fastening means therein;

panel contact means along each said side edge;

a semi-cylindrical groove along said inner face of said end connector member intermediate said side edges having an open side aligned with said median recess, said panel contact means and said groove terminating in a common plane whereby they lie flat along an adjacent end edge of a said panel;

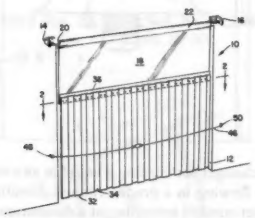
at least one connector groove formed in each said end connector member extending from top to bottom thereof and defining a smooth cylindrical inner surface and having an open mouth directed at an acute angle relative to the plane of said panel body portion, and,

connector hinge strip means having a generally flat planar web portion and smooth cylindrical ribs along either side of said web portion, said rib being connected to said planar web portion in an offset assymetrical manner whereby a plane passing through the centres of both said ribs will lie parrallel to but spaced apart from the plane of said rib, one said rib being shaped to interfit telescopically and rotatably with a said connector groove, in one said end connector member, and the other said rib being shaped to interfit telescopically and rotatably with said connector groove in another said end connector member of a panel adjacent thereto, said ribs being interfitable with said grooves in both left and right handed positions, said web portion extending between said end connector members from top to bottom thereof and providing a continuous flat planar junction between said at least two panels, forming same into a wall as aforesaid.

4,232,725
PASS-THROUGH WEATHER CURTAIN FOR GARAGES AND THE LIKE

Kenneth Gidge, Nashua, N.H., assignor to BSL Corporation, Nashua, N.H.

Filed Dec. 6, 1978, Ser. No. 966,878
Int. Cl.³ A47H 1/00
U.S. Cl. 160—332 **9 Claims**



1. A curtain for use across doorways or the like, comprising

(a) a single rectangular upper panel of a flexible and substantially imperforate material of a width sufficient to extend entirely across said doorway and of a height sufficient to cover a substantial portion of the upper part of said doorway,

(b) mounting means engaging the upper marginal edge of said panel for freely suspending said panel by its upper edge across the top of said doorway,

(c) a plurality of relatively narrow rectangular elongated flexible strips all freely suspended in overlapping relation from the lower edge of said upper panel,

(d) said strips including means defining a graduated barrier to the circulation of air through said doorway which barrier is greater at the side portions of said curtain strips than at the center portion thereof,

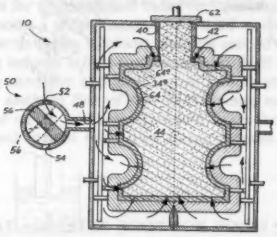
(e) said strips being arranged in a single course of overlapping strips, each strip extending behind one adjacent strip and in front of another adjacent strip and said means including at least one relatively wide strip at each side of said curtain,

(f) said means including a greater number of layers of said strips at the side portions of said curtain than at the center portion thereof.

4,232,726
PROCESS AND CORE BOX ASSEMBLY FOR HEATLESS PRODUCTION OF HOLLOW ITEMS OF MINERAL GRANULAR MATERIAL

Anatol Michelson, 3235 Pine Valley Dr., Sarasota, Fla. 33579

Continuation-in-part of Ser. No. 939,660, Sep. 5, 1978, abandoned. This application Mar. 20, 1979, Ser. No. 22,170
Int. Cl.³ B22C 9/12
U.S. Cl. 164—12 **24 Claims**



1. A process for producing a hollow item, such as a foundry core, by reacting a catalyst gas with binder coated on granular material comprising:

providing a core box having a pattern formed of microporous material;

investing binder-coated granular material into a volume defined by said pattern;

sealing said core box and said pattern so that the volume encloses a gas at rest; and

applying a catalyst gas at a predetermined pressure through said pattern so that the catalyst gas exerts a uniform pressure from the entire interior surface of said pattern against the enclosed gas volume and penetrates a distance through the granular material for curing same determined by an equilibrium condition being reached between the applied catalyst gas pressure and pressure developed by the enclosed gas, said pattern being formed to permit continuous passage of catalyst gas therethrough so that the catalyst gas will impart pressure against all air molecules existing between granular material adjacent the interior surface of said pattern;

removing uncured granular material from the volume defined by said pattern.

14. A core box assembly for use in producing a hollow item, such as a foundry core, by reacting a catalyst gas with binder coated on granular material comprising:

a pair of core box sections each including a pattern section mounted thereon and spaced therefrom so that when said core box sections and their respective patterns are assembled along a parting line, an air space is provided which surrounds the pattern and an opening extends into the volume defined by the pattern for receiving granular material;

a gas-tight sealing member is provided at said opening for sealing said space after the granular material is introduced;

a port provided in at least one of said core box sections for

permitting introduction of a catalyst gas into the air space; and

said pattern being formed of microporous material which permits substantially uniform and continuous passage of the catalyst gas through the pattern and inwardly toward the hollow volume over the entire interior surface of said pattern.

4,232,727

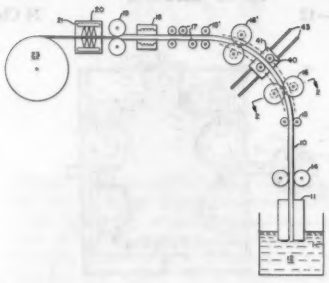
METHOD AND APPARATUS FOR THE CONTINUOUS PRODUCTION OF STRIP

Terry F. Bower, Needham; M. Ronald Randlett, and George Shinopulos, both of Burlington, all of Mass., assignors to Kennecott Copper Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 928,881, Jul. 28, 1978. This application Nov. 1, 1978, Ser. No. 956,793

Int. Cl.³ B22D *11/12*; B21B *1/44, 13/22*

U.S. Cl. 164—76 **23 Claims**



1. A method for the continuous production of metallic strip from a melt comprising:

(1) continuously casting a metallic rod from said melt in a pattern of forward and reverse stroke with respect to a continuous casting mold,

(2) continuously transforming the forward and reverse strokes of said rod to a forward motion having a substantially constant forward velocity, and

(3) continuously hot rolling said continuously produced rod into finished strip,

said casting step, transforming step and hot rolling step being performed to act on a metal rod which is continuous from said mold through said hot rolling step to continuously form an integrated strip.

4,232,728

METHOD FOR ENHANCED HEAT TRANSFER

Gary W. Fenner, Grand Island, and Elias G. Ragi, Williamsville, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 721,861, Sep. 9, 1976, Pat. No. 4,154,293. This application Feb. 26, 1979, Ser. No. 15,425

Int. Cl.³ F28F *13/08*

U.S. Cl. 165—1 **4 Claims**

1. A method for enhanced heat transfer between a first fluid at first inlet temperature and a second fluid at second initial temperature substantially different from said first inlet temperature in a heat exchanger wherein said first fluid is flowed through at least one metal tube in heat transfer relation with said second fluid outside said tube, comprising the steps of: providing a single layer of randomly distributed metal bodies each individually bonded to the tube inner surface substrate spaced from each other and substantially surrounded by said substrate so as to form body void space with the tube effective inside diameter and body height related to each other such that in the ratio e/D, wherein e is the arithmetic average height of said bodies on said substrate and D is the effective inside diameter of the tube, e/D is at least 0.006, and the body void space is between 10 percent and 90 percent of the substrate total area; and passing said first fluid through said tube under turbulent

flow conditions in at least part of said tube such that its Equivalent Reynolds Number in such tube part is at least 9,000.

4,232,729

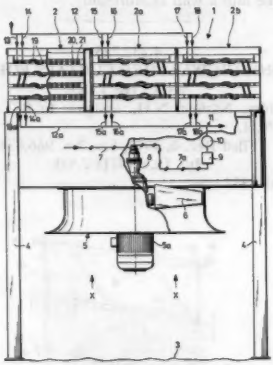
AIR-COOLED HEAT EXCHANGER FOR COOLING INDUSTRIAL LIQUIDS

Jocely P. Ingram, Sasolburg, South Africa; Harry Kassat, Bochum, and Herbert Kolenda, Witten-Herbede, both of Fed. Rep. of Germany, assignors to South African Coal, Oil & Gas Corp., Limited, Johannesburg, South Africa and Gea Luftkuehlergesellschaft Happel GmbH & Co., Bochum, Fed. Rep. of Germany

Filed Jun. 1, 1978, Ser. No. 911,704

Int. Cl.³ F28F *27/00*

U.S. Cl. 165—39 **20 Claims**



1. A heat exchanger for cooling a liquid in an external stream of cooling gas flowing in a predetermined direction, comprising: a liquid inlet conduit extending at a downstream portion of said external stream and a liquid outlet conduit extending at an upstream portion of said external stream; plural cooling conduit sets including a pair of adjoining cooling conduit connected parallel to each other between said inlet and outlet conduits, each of said cooling conduit sets being shaped into a meander-like configuration and defining straight conduit sections arranged side by side, said plural conduit sets being arranged in at least two rows spaced from one another in said predetermined direction, and each located in a plane transverse to said direction, and further defining connecting conduit sections connecting said straight conduit sections of respective cooling conduits in said pairs in series for providing in each set two parallel flows of the liquid meandering both in a direction counter to and transverse to said predetermined direction.

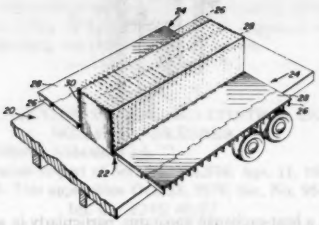
4,232,730
RADIOACTIVE MATERIALS TRANSPORTING CONTAINER AND VEHICLES

Stanton L. Reese, 11409 Duryea Dr., Potomac, Md. 20854

Division of Ser. No. 324,576, Jan. 18, 1973, Pat. No. 4,023,615, which is a continuation-in-part of Ser. No. 109,925, Jan. 26, 1971, Pat. No. 3,727,059. This application May 16, 1977, Ser. No. 797,391

Int. Cl.[2] F28F *5/00*; G21F *5/00*

U.S. Cl. 165—41 **22 Claims**



1. A conveyance for transporting radioactive materials which comprises a vehicle having a frame, a smooth-wall container for holding the radioactive material having a beta gamma radioactive absorbing material surrounding the radioactive material therein, a secondary container operable in opened and closed positions, means for facilitating the opening and closing of said secondary container, means for rigidly mounting said secondary container to said vehicle frame, and heat-dissipating means attached to said secondary container, said secondary container operable in said open position for facilitating placement and removal of said smooth-wall container onto and off of said vehicle frame and operable in said closed position to substantially surround and thermally contact said smooth-wall container for transferring heat generated within said smooth-wall container to the atmosphere by way of said heat-dissipating means.

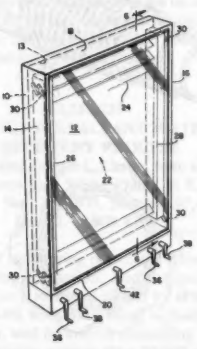
4,232,731
PASSIVE SOLAR DEVICE FOR HEATING AND COOLING

Roy Kaplow, Newton, and Marvin C. Lewis, Boston, both of Mass., assignors to General Solar Energy Corporation, Boston, Mass.

Filed Jun. 28, 1978, Ser. No. 919,863

Int. Cl.[3] F25B *29/00*

U.S. Cl. 165—48 S **20 Claims**



1. A solar control and storage unit for location at windows and the like, said unit comprising:

(a) means including a pair of generally parallel transparent panes defining a hermetic compartment, said panes being composed of glass;

(b) a gas which provides a good insulating capability within said compartment at substantially atmospheric pressure;

(c) a plurality of elongated, generally parallel vanes mounted in said compartment generally parallel to said panes;

(d) each of said vanes presenting at least three external facets and an internal compartment;

(e) a first of said external facets being characterized by relatively high absorptivity with respect to solar radiation and relatively low emissivity with respect to infrared radiation at an operating temperature;

(f) a second of said external facets being characterized by relatively high absorptivity and relatively high emissivity with respect to infrared radiation at said operating temperature;

(g) a third of said external facets being characterized by relatively high specular reflectivity with respect to solar radiation;

(h) a phase transformation energy storage medium within said internal compartment, said phase transformation occurring at said operating temperature; and

(i) means for adjusting said vanes for operation in at least a first mode, a second mode, and a third mode, said first of said facets facing outdoors and said second of said facets facing indoors in said first mode, said third of said facets facing outdoors and said first of said facets facing outdoors and said first of said facets facing indoors in said second mode, said second of said facets facing outdoors and said first of said facets facing indoors in said third mode.

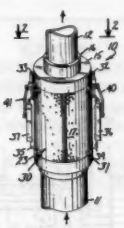
4,232,732
HEAT ARRESTER BOOT FOR ROOM STOVE

Albert V. Johnson, R.R. 1, Box 87, Erhard, Minn. 56534

Filed Apr. 24, 1978, Ser. No. 899,356

Int. Cl.[3] F28F *3/08*

U.S. Cl. 165—77 **7 Claims**



1. A heat arrester boot for room stoves for extracting heat from waste gases and smoke comprising:

a bottom inlet chamber having an entrance port through which the waste gases and smoke enter, and a generally circular lip;

a top outlet chamber having an exit port from which the waste gases and smoke exit, and a generally circular lip;

a generally cylindrical central chamber between said inlet and outlet chambers and including a pair of cross sectionally arcuate door members to form a semi-cylindrical portion of said central chamber, and a semi-cylindrical chamber wall fixedly mounted on said inlet chamber and having opposite horizontally spaced ends, each of said door members being mounted on one of said ends of said chamber wall for outward pivotal movement about a generally vertical axis;

a pair of generally parallel rails attached to said outlet chamber;

a pair of parallel receiving cylinders attached to said chamber wall and slidably mounting said rails;

a pair of handles having first ends and second ends, said first

ends being pivotally connected to said receiving cylinders;

a pair of links pivotally connected at first ends to said handles between said first and second ends thereof;

a pair of anchoring members positioned on said rails, said anchoring members being pivotally connected to second ends of said links, said handles, said links and said anchoring members cooperating to impart reversible movement to said outlet chamber along a path defined by said rails and said receiving cylinders when said handles are raised and lowered;

means for adjustably securing said anchoring members to said rails; and

an inner core including a plurality of parallel spaced hollow cylindrical tubes having upper and lower ends, and generally circular top and bottom plates having a plurality of apertures formed therein for receiving said ends of said cylindrical tubes;

said lip of said inlet chamber being sized to receive said bottom plate, said lip of said outlet chamber being sized to surround said top plate when said outlet chamber is moved toward and near said central chamber.

4,232,733

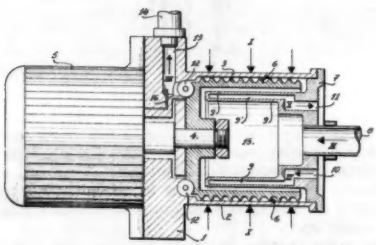
THERMAL EXCHANGER

Tadeusz Piotrowski, Vincennes, France, assignor to Etablissement Euroburner, Vaduz, Liechtenstein

Continuation of Ser. No. 817,034, Jul. 19, 1977, abandoned. This application May 16, 1979, Ser. No. 39,553

Int. Cl.³ F28F *9/02*; F28D *11/02*

U.S. Cl. 165—89 **9 Claims**



1. A heat exchanger for heating or cooling a liquid, comprising a stationary outer shell, a drum rotatable coaxially in the shell, the outer periphery of the drum being adjacent the inner periphery of the shell, stationary heat exchange means within the drum, means to feed a liquid into the drum past said stationary heat exchange means and then between said outer periphery of said drum and said inner periphery of said shell, and impeller means on and extending axially along said outer periphery of said drum to move said liquid in a circuitous path along said inner periphery of said stationary outer shell upon rotation of said drum.

4,232,734

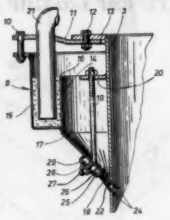
TRICKLER HEAT-EXCHANGE APPARATUS

Erich Hatje, Watenbüttel, and Norbert Reinert, Brunswick, both of Fed. Rep. of Germany, assignors to Buehler-Miag GmbH, Brunswick, Fed. Rep. of Germany

Filed Jun. 3, 1977, Ser. No. 803,352

Int. Cl.³ F28F *25/04*

U.S. Cl. 165—118 **12 Claims**



1. In a heat-exchange apparatus, particularly in a cooler for cement manufacture, a combination comprising an upright wall having two sides, one of which is contacted by material to be cooled; cooling means adjacent an upper portion of the other of said sides and including a cooling water receptacle and a downwardly inclined guide baffle extending from said receptacle towards said other side and defining therewith a gap of non-uniform width; and a plurality of fibers bridging said gap and having free ends contacting said other side so that cooling water travels from said receptacle over said guide baffle and along said fibers to be discharged by the same onto said other side as a film which has a constant and substantially uniform thickness despite the non-uniform width of said gap.

4,232,735

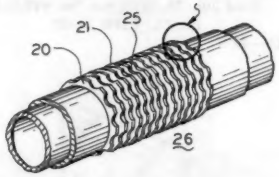
DOUBLE-WALLED FINNED HEAT TRANSFER TUBE

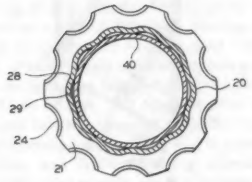
Sung C. Kim, Des Plaines, and Marvin P. Schwartz, Arlington Heights, both of Ill.

Filed May 5, 1978, Ser. No. 903,049

Int. Cl.³ F28F *1/14*

U.S. Cl. 165—183 **6 Claims**





1. A double-walled heat transfer tube comprising:

an elongated inner tube;

an elongated outer tube extending over a portion of said inner tube;

said outer tube having a plurality of inwardly projecting ribs contacting the outer surface of said inner tube and acting to hold said inner and outer tubes in heat conducting relationship;

said ribs forming a plurality of channels between said inner and outer tubes; and

said outer tube having an external finned surface, said external finned surface including a plurality of rows of grooves extending axially over substantially the length of said outer tube each of said rows of said plurality of rows of grooves being in substantially radial alignment with a corresponding one of said plurality of ribs.

4,232,736

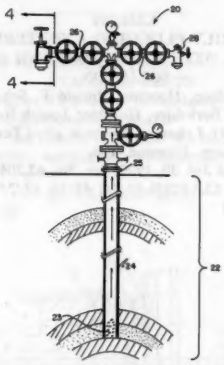
LEAK DETECTION SYSTEM AND CONTROL USING NON-RIGID BLADDER

Kibbie P. Pillette, Abbeville, La.

Continuation-in-part of Ser. No. 786,576, Apr. 11, 1977, abandoned. This application Oct. 23, 1978, Ser. No. 954,578

Int. Cl.[2] E21B *43/12*

U.S. Cl. 166—53 **16 Claims**



1. An apparatus for detecting leaks in suspect piping system fittings comprising:

a. non-rigid bladder means for sealably encapsulating a suspect fitting portion of a piping system where leaks may occur;

b. means for sealably attaching said non-rigid bladder means to the suspect fitting; and

c. valve closure means responsive to the occurrence of a leak in the suspect fitting and collected by said bladder means for halting the flow of fluid within the piping system to which said bladder means is attached.

4,232,737

DOUBLE TAPERED SURFACTANT WATERFLOOD OIL RECOVERY PROCESS

Timothy N. Tyler, and Joseph T. Carlin, both of Houston, Tex., assignors to Texaco Inc., White Plains, N.Y.

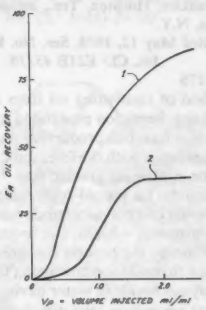
Filed Nov. 26, 1979, Ser. No. 97,470

Int. Cl.[3] E21B *43/22*

U.S. Cl. 166—273 **11 Claims**

1. In a method of recovering petroleum from a subterranean, petroleum-containing formation, said formation being penetrated by at least one injection well and by at least one spaced-apart production well, both wells being in fluid communication with the formation, said formation containing water of known or determinable salinity greater than 20,000 parts per million total dissolved solids, comprising injecting an aqueous, saline surfactant-containing fluid into the formation, said fluid containing at least one primary anionic surfactant comprising an organic sulfonate and at least one solubilizing co-surfactant selected from the group consisting of alkylpolyethoxy sulfates, alkylarylpolyethoxy sulfates, alkypolyalkoxyalkylene sulfonates, alkylarylpolyalkoxyalkylene sulfonates, and mixtures thereof, and following said surfactant fluid with an aqueous fluid containing a viscosifying amount of a hydrophilic polymer, the salinity of the polymer-containing fluid being less than 50,000 parts per million total dissolved solids, wherein the improvement comprises

decreasing both the salinity and concentration of solubilizing



co-surfactant of the surfactant fluid from a value at the leading edge of the surfactant fluid at which the salinity is from 50 to 150 percent of the salinity of the water present in the subterranean formation, to a final value at the trailing edge of the surfactant fluid at which the salinity is from 75 to 300 percent of the salinity of the hydrophilic polymer-containing fluid, and maintaining the concentration of solubilizing co-surfactant at a value which is at least sufficient to render the petroleum sulfonate partially soluble in the fluid at the salinity of each portion of the surfactant fluid.

4,232,738

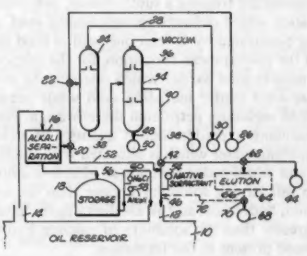
PETROLEUM RECOVERY PROCESS USING NATIVE PETROLEUM SURFACTANTS

Teh F. Yen, Altadena, and Paul A. Farmanian, Glendale, both of Calif., assignors to University of Southern California, Los Angeles, Calif.

Filed Nov. 6, 1978, Ser. No. 958,291

Int. Cl.[3] E21B *43/16, 43/20*

U.S. Cl. 166—274 **28 Claims**



1. In a process for recovering petroleum from a subterranean reservoir thereof penetrated by at least one injection well and at least one production well spaced apart in the reservoir in which a liquid slug is injected through said injection well into said reservoir followed by the injection of alkaline floodwater whereby to displace oil from said reservoir for recovery through said production well, the improvement according to which said slug is non-aqueous and comprises at least a surfac-

tant portion of a fraction consisting essentially of natural components of petroleum, said fraction being distilled under conditions equivalent to vacuum of about 1 Torr in the temperature range of 100°-200° C. from petroleum of the type having reduced interfacial tension with water at high pH.

4,232,739

AQUEOUS POLYSACCHARIDE-CONTAINING FLUID HAVING SUPERIOR FILTERABILITY AND STABILITY AND THEIR USE IN RECOVERING OIL

Barbara J. Franklin, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed May 12, 1978, Ser. No. 905,490
Int. Cl.[3] E21B *43/16*
U.S. Cl. 166—275 **13 Claims**

1. In a method of recovering oil from a subterranean, petroleum-containing formation penetrated by at least one injection well and by at least one production well, both wells being in fluid communication with the formation, said formation also containing brine containing greater than 7.5 parts per million water soluble borates (as boron) comprising injecting an aqueous viscous solution of a polysaccharide containing in excess of 10 percent D-mannose, wherein the improvement comprises preparing the fluid by the process comprising

(a) preparing a first solution containing 0.1 to 4.0 percent by weight polysaccharide in water having a salinity less than 15,000 parts per million total dissolved solids and containing less than 7.5 parts per million water soluble borates (as boron),

(b) shearing the first solution sufficiently to ensure that the first solution will pass readily through a 3 μm filter;

(c) diluting the first solution with brine having greater than 50,000 parts per million total dissolved solids including more than 7.5 parts per million water soluble borates as boron, the volume ratio of the first solution and brine being sufficient to produce a second polysaccharide solution having a concentration of polysaccharide from 10 to 5,000 parts per million polysaccharide; and

(d) shearing the second solution sufficiently to ensure that the second solution will pass readily through a 3 μm filter.

4,232,740

HIGH TEMPERATURE STABLE SAND CONTROL METHOD

Jack H. Park, Houston, Tex., assignor to Texaco Development Corp., White Plains, N.Y.

Filed May 23, 1979, Ser. No. 41,835
Int. Cl.[2] E21B *33/134, 43/04, 43/24*
U.S. Cl. 166—276 **32 Claims**

1. A method for treating a subterranean, petroleum-containing formation which contains unconsolidated sand, said formation being penetrated by at least one well in fluid communication with the subterranean formation, for the purpose of forming a permeable solid barrier which restrains the movement of particulate solid matter including sand while permitting passage of fluid including petroleum therethrough, comprising:

a. introducing a predetermined quantity of treating liquid comprising water which is saturated with calcium hydroxide, and additionally contains an effective amount of calcium salt having solubility greater than the solubility of calcium hydroxide, and an alkalinity agent having solubility greater than the solubility of calcium hydroxide, into the sand present in the formation;

b. allowing the treating liquid to remain in the sand mass for a predetermined period;

c. injecting a second quantity of treating liquid into the sand mass to displace the spent treating liquid therefrom; and

d. allowing the second quantity of liquid to remain in the formation for a predetermined period of time to cause cementing between the sand grains, thereby forming a permeable, competent, sand restraining barrier in the well.

22. A method of forming a permeable, mechanically stable sand restraining barrier in a formation penetrated by at least one

a. enlarging the well bore to form a cavity adjacent to the original well bore;

b. introducing a predetermined quantity of granular material of predetermined particle size and size range into the well bore;

c. introducing a treating liquid comprising water which is saturated with calcium hydroxide and additionally contains a predetermined quantity of a calcium salt having solubility greater than the solubility of calcium hydroxide and a predetermined quantity of an alkalinity agent;

d. allowing the treating liquid to remain in the sand pack for a predetermined period of time sufficient to cement the sand grains together; and

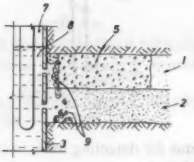
e. repeating steps c to d at least once.

4,232,741

TEMPORARILY PLUGGING A SUBTERRANEAN RESERVOIR WITH A SELF-FOAMING AQUEOUS SOLUTION

Edwin A. Richardson, Houston; Ronald F. Scheuerman, Bellaire; David C. Berkshire, Houston; Joseph Reisberg, Houston, and James H. Lybarger, Houston, all of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Jul. 30, 1979, Ser. No. 62,204
Int. Cl.[3] E21B *33/16, 43/16, 43/27*
U.S. Cl. 166—281 **10 Claims**



1. A process for treating a subterranean reservoir into which a well is completed comprising:

compounding an aqueous solution in which the solutes consist essentially of at least one each of (a) a reactive compound for generating nitrogen gas at a rate affected by the temperature and pH of the solution, (b) a surface-active compound for causing the solution to be converted to a relatively immobile foam as gas is generated within the solution, (c) a pH-controlling system for initially maintaining a relatively high pH at which the gas-generating reaction rate is relatively slow at temperatures less than the reservoir temperature and subsequently maintaining a barely acidic pH at which that reaction rate is only moderately fast at temperatures near the reservoir temperature and, (d) a relatively slowly reactive acid-yielding compound for relatively slowly reducing the solution pH from said relatively high value to said barely acidic value; and,

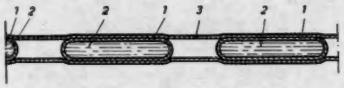
injecting the compounded solution into the reservoir at a rate such that (a) a significant portion of injected solution flows into at least the largest pores or other openings in or along the reservoir rock before that portion of solution has generated a significant fraction of the amount of gas it is capable of generating and (b) said portion of injected solution remains within said openings until it becomes converted into a relatively immobile foam.

4,232,742

FLAME-GUARD FOR ELECTRICAL INSTALLATIONS

Willy P. A. Dick, Huddinge, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Jun. 1, 1978, Ser. No. 911,488
Claims priority, application Sweden, Jun. 9, 1977, 7706753
Int. Cl.[3] A62C *37/14*
U.S. Cl. 169—58 3 Claims



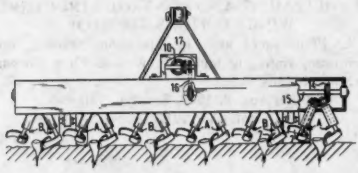
1. A flame protective device for electrical cable installations comprising a plurality of capsules secured together one after another to form a string, each of said capsules containing a substance having flame-extinguishing properties, said capsules being constructed to burst or open up when heated, thereby releasing said flame-extinguishing substance, the individual capsules being arranged in a line and a hose surrounding said capsules and maintaining the capsules in spaced positions in said line.

4,232,743

DEVICE FOR DIGGING UP TUBEROUS PLANTS, FOR EXAMPLE, BEETS

Cornelis J. Steketee, Driewegen, Netherlands, assignor to Vandenende B.V., Borssele, Netherlands

Filed Feb. 8, 1979, Ser. No. 10,253
Claims priority, application Netherlands, Feb. 24, 1978, 7802095
Int. Cl.[3] A01D *25/04*
U.S. Cl. 171—55 9 Claims



1. Apparatus for digging up tuberous crops such as beets, comprising in combination:

frame means adapted to be moved over the ground surface;

a pair of shafts depending from said frame means in mutually diverging relation to each other transversely of the direction of movement of the frame means;

drive means for rotating said shafts;

each shaft terminating in a lower end portion adapted to move over the ground surface in closely spaced relation thereabove, the lower end portions of said shafts being laterally spaced apart relative to the direction of movement of the apparatus and each shaft defining an axis which is inclined, with respect to the vertical, laterally inwardly toward the other shaft; and

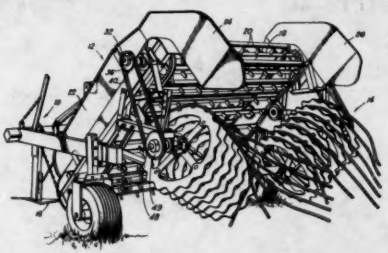
a pair of digger blades one at the lower end of one shaft and the other at the lower end of the other shaft, each digger blade having a leading end fixed to the lower end portion of its associated shaft and extending therefrom in a direction opposite to the direction of rotation of the shaft and in outwardly spiralling and helical relation to the axis of such shaft to terminate in a trailing end spaced below its respective shaft by an amount such that said trailing end follows a circular path centered on the axis of its shaft and perpendicular thereto with a portion only of such path lying below the ground surface, each blade presenting outer and inner surfaces extending between said leading and trailing ends thereof of widths sufficient respectively to displace soil laterally toward the other blade and to lift soil upwardly in response to rotation of the associated shaft while such blade is penetrated into the ground.

4,232,744

DIGGER-SHAKER-INVERTER APPARATUS

Jack E. Thompson, Chula, Ga., assignor to Lilliston Corporation, Albany, Ga.

Continuation of Ser. No. 616,178, Sep. 24, 1975, abandoned. This application Apr. 4, 1977, Ser. No. 784,264
Int. Cl.[3] A01D *29/00*
U.S. Cl. 171—101 6 Claims



1. In a root crop harvesting apparatus of the type having digging means operatively associated with the harvesting apparatus for digging and removing adjacent rows of root crop plants from their growing implantation in the ground, and conveying means operatively associated with the harvesting apparatus for conveying the rows of root crop plants removed by said digging means upwardly along upwardly inclined, spaced paths to elevated discharge regions while separating soil from the roots of the plants, the improvement which comprises a pair of open, reel-like structures disposed beneath said conveying means with one of the structures below one discharge region and the other structure below the other discharge region, and a set of trailing tine elements associated with each reel-like structure for supporting the respective rows of plants and crowding such rows together into a single windrow wherein the plants are inverted so that the plant foliage engages the ground and the roots are disposed uppermost in exposed relation; each reel-like structure comprising a series of spaced, annular discs having outer peripheral edges of undulating form and a series of circumferentially spaced rods extending between said discs adjacent the outer peripheries of said discs; means rotatably supporting said reel-like structures solely at their ends for rotation about downwardly and inwardly inclined axes thereby providing completely open central cores within said reel-like structures free of any interior obstructions between their ends with the inner ends of such structures being spaced apart; each set of tines including an outermost tine having a trailing end portion extending generally horizontally and laterally inwardly, an innermost tine having a trailing end portion extending generally vertically downwardly, and intermediate tines having trailing end portions which extend progressively from generally horizontally to generally vertically and in decreasing laterally directed fashion from said outermost tine to said innermost tine such that the tines of each set terminate essentially in a generally vertical plane to define a windrow-forming region between the set of tines, adjacent tines being in straddling relation to one of said discs and each tine having a mounting end portion which extends rearwardly from the front side of said reel-like structure above said circumferentially spaced rods and curves similarly to the disc with which it is associated and is disposed approximately at the level of the valleys of the undulated periphery of such disc to merge smoothly into its trailing end

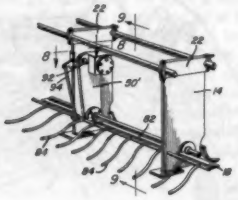
portion; and means for rotating said reel-like structures to urge the plants rearwardly along said tines while bumping and shaking those plants supported by said mounting end portions of the tines, each of said open reel-type structures extending along substantially half the length of its associated set of tines so as to subject the unearthed root crop to an extended cleaning action during the inversion process.

4,232,745

HARVESTER WITH MECHANICAL ROD WEEDER AND SOIL AGITATOR

Jose A. B. Viramontes, Star Rte. Box 18-A, Mesilla Park, N. Mex. 88047

Filed May 22, 1979, Ser. No. 41,882
Int. Cl.³ A01B *39/19*; A01D *15/04*
U.S. Cl. 172—44 **16 Claims**



14. In a crop harvesting implement for attachment to the rear of a tractor, the combination comprising:

a transverse elongated frame member;

a plurality of downwardly extending shanks, each shank being adjustably mounted upon said frame member for movement along a longitudinal dimension thereof;

a weeder bar extending through and being supported and journaled in each one of said shanks;

weeder bar drive means attached to said weeder bar for causing rotation of said weeder bar in a direction against the forward movement of said implement;

cleaner bar means having a plurality of sections, each section extending between two adjacent shanks, said cleaner bar means being positioned at not more than 1/16" behind said rod weeder;

agitator means having a plurality of tines connected for vertical oscillatory motion, said agitator means being connected to said shanks directly behind said cleaner bar; and

connector means for connecting said implement to the three-point hitch of a tractor.

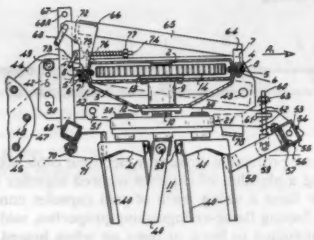
4,232,746

SOIL CULTIVATING IMPLEMENTS

Cornelis van der Lely, 7, Brüschenrain, Zug, Switzerland

Continuation of Ser. No. 723,727, Sep. 16, 1976, abandoned. This application Aug. 8, 1978, Ser. No. 932,175
Claims priority, application Netherlands, Sep. 19, 1975, 11053
Int. Cl.³ A01B *33/06*
U.S. Cl. 172—59 **9 Claims**

1. A soil cultivating implement comprising a frame and a plurality of rotatable soil working members arranged in a transverse row, said members being journalled in an elongated portion of said frame and said portion extending transverse to the direction of travel, said soil working members being mounted on corresponding upwardly extending shafts and having downwardly extending soil working tools, driving means connected to rotate said members about axes defined by said shafts, said members being arranged in neighboring pairs that rotate in relative opposite directions and towards one another to pass soil rearwardly between the pairs, a supporting soil crumbler roller being positioned to the rear of said row of the working members and being adjustably interconnected to the frame with means that sets the working depth of said members, an elongated substantially horizontal soil deflector beam being positioned between the row of soil working members and said roller, said beam substantially coextending with said row and being located adjacent the rear of said soil working members, near the ground to deflect and level at least part of the soil thrown rearwardly by said soil working members, setting means interconnecting said beam to the frame and the



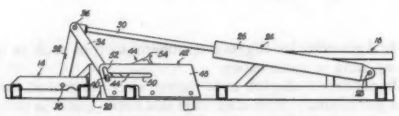
position of said beam being settable in any one of a plurality of different levels relative to the working depth of said members, said beam being normally positioned closely adjacent the ground, substantially below said frame leaving an open space between the beam and said frame, whereby a portion of the soil worked by said members can pass over the beam into the path of said roller to prepare a seed bed.

4,232,747

FARM IMPLEMENT AND CONTROL STRUCTURE FOR WING SECTIONS THEREOF

Billy J. Pfenninger, and F. Harrison Stansel, both of Hutchinson, Kans., assignors to Krause Plow Corporation, Hutchinson, Kans.

Filed Aug. 3, 1978, Ser. No. 930,494
Int. Cl.³ A01B *73/00*
U.S. Cl. 172—311 **19 Claims**



10. In a farm implement:

a pair of normally horizontal sections for supporting ground-engaging tool means;

hinge means interconnecting the sections for up and down swinging movement of one of said sections;

a lift link pivotally attached to said one section and normally extending upwardly therefrom;

a carriage;

a force-transmitting lever pivotally attached to said carriage and normally extending upwardly therefrom;

said link and lever converging as their normally uppermost ends are approached; and

power means pivotally connected with the other of said sections and with said uppermost ends of the link and lever,

said carriage being supported by said other section for movement away from said one section as the power means swings the link and the lever to a position folding the one section into overlying relation to the other section.

4,232,748

SPRAY-ASSISTED PNEUMATIC STONE-WORKING APPARATUS

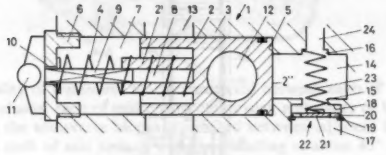
Hans Thoma, Neuhausen am Rheinfall, Switzerland, assignor to SIG Schweizerische Industrie-Gesellschaft, Neuhausen am Rheinfall, Switzerland

Filed May 7, 1979, Ser. No. 37,398

Claims priority, application Fed. Rep. of Germany, May 5, 1978, 2819589

Int. Cl.³ B25D *17/16;* **E21C** *7/08*

U.S. Cl. 173—3 **9 Claims**



1. In a pneumatically operated stone-working tool including a tool drive, a pneumatic line connected to the tool drive for supplying pressurized gas thereto; a liquid spray-generating means for spraying the work area with a liquid; a liquid line connected to the spray-generating means for supplying liquid thereto; a control assembly for effecting energization and de-energization of the tool drive; the control assembly including a rotatable valve plunger in the pneumatic line; the valve plunger having a first angular position in which it maintains the pneumatic line open for allowing pressurized gas to be admitted to the tool drive from a source of pressurized gas; the valve plunger further having a second angular position in which it maintains the pneumatic line closed for preventing pressurized gas to be admitted to the tool drive; and a manually actuated lever connected to the valve plunger for rotating the valve plunger into the first or second angular position; the improvement wherein said control assembly comprises

(a) means defining a valve chamber in which said valve plunger is rotatably and linearly slidably received; said chamber being in the path of said pneumatic line and said liquid line; said plunger having a first linear position in which it maintains said pneumatic line closed in either angular position of said plunger and a second linear position in which it maintains said pneumatic line open solely when said plunger is in its said first angular position;

(b) force-exerting means continuously urging said plunger towards its said first linear position with a predetermined force; and

(c) a work face forming part of said plunger and being oriented for continuous exposure to a pressure of the liquid in that part of said chamber which is in communication with said liquid line; said pressure acting on said work face against said predetermined force for displacing said plunger into its said second linear position when said pressure increases to a predetermined level indicative of a safe pressure for operating said liquid spray-generating means.

4,232,749

CONVERTIBLE ROTARY/PERCUSSION DRILL

Fritz Rohrbach, Pieterlen, Switzerland, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 11, 1978, Ser. No. 941,264

Claims priority, application Switzerland, Oct. 22, 1977, 2747537/77

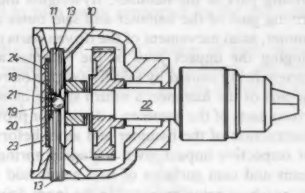
Int. Cl.² B25D *15/00*

U.S. Cl. 173—48 **7 Claims**

1. In a drill selectively operable as rotary drill or percussion drill, mounted in a housing (10) having a recess, said drill having a spindle having a longitudinal axis, the improvement comprising

a ball (19) forming a bearing member;

a plastic slider (11) mounted in said recess for movement, under external control, from a first position wherein said drill is operative as a rotary drill to a second position wherein said drill is operative as a percussion drill, said plastic slider having an opening (18) aligned with said spindle along said longitudinal axis thereof when in said first position, the ball (19) being located in said opening for



constituting a thrust bearing for said spindle when said drill is operative as rotary drill;

a bearing plate (21) positioned in said further recess, said bearing plate and said ball together constituting said thrust bearing for said spindle when said drill is operative as rotary drill;

and at least one latching element (14) formed on the slider for selectively latching said slider in said first or said second position,

whereby the plastic slider and the latching elmeent will form a single unitary plastic member.

4,232,750

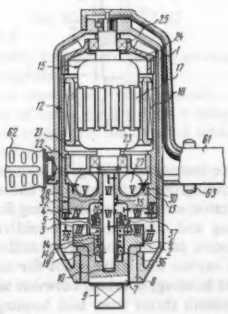
IMPACT WRENCH WITH A ROTARY TOOL DRIVE

Georgy A. Antipov, ulitsa Krasny Mayak, 3, kv. 146; Mikhail L. Gelfand, Yaroslavskoe shosse, 129, kv. 44; Boris G. Goldshtein, ulitsa Molodogvardeiskaya, 24, korpus 1, kv. 26, all of Moscow; Mikhail I. Rutgaizer, ulitsa Kuibysheva, 4, kv. 5; Nikolai K. Suut, ulitsa Lenina, 38, kv. 90, both of Vyborg Leningradskoi oblasti; Yakov I. Tsipenjuk, ulitsa Kirova, 5, kv. 30, Solntsevo Moskovskoi oblasti; Jury P. Shishulin, Jubileiny prospekt, 18, kv. 30, Khimki Moskovskoi oblasti; Apas G. Galimov, ulitsa Kuibysheva, 15, kv. 13, Sverdlovsk; Oleg Y. Sutyagin, ulitsa Dekabristov, 5, kv. 51, Sverdlovsk, and Oleg A. Yankovsky, ulitsa Soni Morozovoi, 175a, kv. 95, Sverdlovsk, all of U.S.S.R.

Filed Oct. 26, 1978, Ser. No. 954,756

Int. Cl.² B25B *21/02*

U.S. Cl. 173—93.6 **4 Claims**



1. An impact wrench comprising: a casing; a motor accommodated in said casing; a spindle journalled in said casing; an

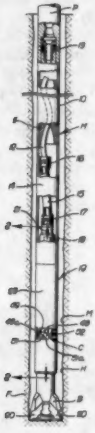
anvil having impact jaws and an axial bore, said anvil being coupled to said spindle for rotation therewith and being fixed axially with respect to said casing; a counterbore in said axial bore of said anvil; a composite hammer accommodated in said casing and including a driving part coupled to said motor for rotation therewith, an outer driven part connected to said driving part for combined rotation and having impact jaws engageable with the impact jaws of said anvil, and an inner driven part connected to the outer driven part for combined rotation and received in said counterbore of the anvil; said driven parts of the hammer being axially movable relative to said driving part of the hammer; flyweights located between said driving part of the hammer and said outer driven part of the hammer, axial movement of the driven parts of the hammer for bringing the impact jaws of the hammer and anvil into engagement being caused by said flyweights on rotation of said driving part of the hammer; a return spring mounted between said driven parts of the hammer; a device for providing preliminary interaction of the hammer and anvil before engagement of their respective impact jaws, including spring-loaded locking means and cam surfaces of said anvil, said spring-loaded locking members being mounted in the inner driven part of the hammer in an axial space between the impact jaws of said hammer and anvil; means defining cam surface means on the anvil and a working spring received in said counterbore of the anvil between said inner driven part of the hammer and said anvil, said device preventing engagement of the respective impact jaws until said locking means is moved from between the impact jaws by engagement with said cam surface means.

4,232,751

IN-HOLE MOTOR DRILL WITH BIT CLUTCH

Kurt H. Trzeciak, Fountain Valley, Calif., assignor to Smith International, Inc., Newport Beach, Calif.

Filed Nov. 2, 1978, Ser. No. 957,179
Int. Cl.³ E21B *4/00*
U.S. Cl. 175—101 **21 Claims**



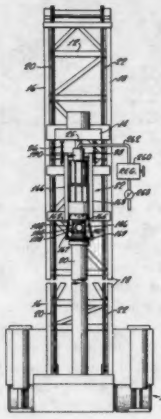
1. An in-hole motor comprising: an elongated motor stator including a housing connectable at one end to a pipe string; a rotor in said stator; a drive shaft extending from the other end of said housing and connected with said rotor for rotation therewith relative to said housing; a drill bit connector to mount a drill bit on said drive shaft for rotation therewith relative to said housing; bearings between said shaft and said housing to transmit thrust from said housing to said shaft in opposite directions to load said bit axially against the bottom of a bore hole and to pull said bit off the bottom of the bore hole; normally disengaged clutch means engageable between said housing and said shaft for coupling said shaft and housing for rotation together.

4,232,752

METHOD AND APPARATUS FOR DRIVING PIPE

Ernest D. Hauk, Yucca Valley, and Jesse C. Kirkpatrick, Mission Viejo, both of Calif., assignors to Service Equipment Design Co., Inc., Signal Hill, Calif.

Filed Mar. 20, 1978, Ser. No. 888,312
Int. Cl.² E21B *1/02*
U.S. Cl. 175—135 **29 Claims**



1. A pipe hammer comprising
an end cap,
inner and outer concentric sleeves fixed to said end cap in radially spaced relation to each other to define an annular chamber closed at one end by said end cap,
an annular piston slidably mounted in said chamber, an annular anvil slidably mounted in and sealing the other end of said chamber,
means for radially positioning said sleeves relative to each other at said other end of the chamber to maintain concentricity of said sleeves, said means comprising a forward housing around said outer sleeve, and annular retainer within said inner sleeve, and means for connecting said housing and retainer to said end cap,
means for reciprocating said piston within said chamber to cause the piston to repetitively strike said anvil, and
means for receiving blows from said anvil and transmitting such blows to a pipe to be driven.

4,232,753

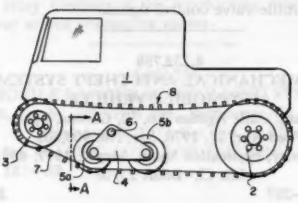
ENDLESS TRACK VEHICLE

Kaj Carlson, Singsby, Finland, assignor to Konetehdas Maskinfabrik NORCAR Ky Kb, Finland

Filed Oct. 25, 1978, Ser. No. 954,606
Claims priority, application Finland, Oct. 28, 1977, 773232
Int. Cl.² B62D *55/20*
U.S. Cl. 180—9.2 R **7 Claims**

1. An endless track vehicle comprising, a vehicle body, a pair of driving wheels rotatably mounted near a rear end of the body supporting the rear end of the body, a pair of running wheels rotatably mounted and near an opposite front end of the body having a diameter smaller than that of the driving wheels and mounted at the location on the body so that the driving wheels extend lower than the running wheels, a pair of bogies pivotally mounted to the body between the driving and running wheels, two supporting wheels rotatably mounted to each of the bogies for supporting the front end of the body, a pair of

tracks, each wrapped around a drive wheel, the supporting wheels of one bogie and a running wheel, each of said tracks comprising two spaced apart chains extending in a longitudinal direction of the body forming edges of each of said tracks, a



plurality of transverse blocks connected between each of said two chains, each of said chains comprising a plurality of links with the transverse blocks connected between adjacent links with each of said links in a plane extending at about 45° to a plane containing an axis of rotation of said driving wheels.

4,232,754

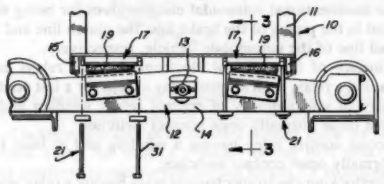
EQUALIZER BAR PAD CONSTRUCTION

Ara L. Corrigan, Davenport; Wayne G. Styck, Bettendorf, and Gerald M. Walden, Davenport, all of Iowa, assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Mar. 19, 1979, Ser. No. 83,999

Int. Cl.³ B62D *55/00*

U.S. Cl. 180—9.5 **17 Claims**



1. In a vehicle (10) having a frame (11) and an equalizer bar (12) movably mounted to the frame for carrying the ground-engaging tractive means of the vehicle, a pair of preloaded energy-absorbing pad assemblies (17,117), each comprising:

a baseplate (18,118) carried by the equalizer bar;

a resiliently compressible pad (19,119) carried on said baseplate;

a cover plate (20,120) overlying said pad to engage said frame and having a connecting portion (28,128); and

a removable clamp (21,121) having a first portion (31,131) removably secured to said connecting portion of the cover plate, and a second portion (32,132) releasably locked to said equalizer bar as an incident of a clamping force being developed in said clamp to compressively preload said pad between said cover plate and baseplate, release of said clamp permitting said pad to urge said cover plate forcibly against said frame or provide a preselected resistance to movement of said equalizer bar toward said frame during operation of the vehicle.

4,232,755

ELECTRIC MOTOR VEHICLE

Douglas Dow, 1052 Seminole, Detroit, Mich. 48214

Division of Ser. No. 766,534, Feb. 7, 1977, Pat. No. 4,171,730. This application May 14, 1979, Ser. No. 38,503

Int. Cl.³ B60R *21/02*

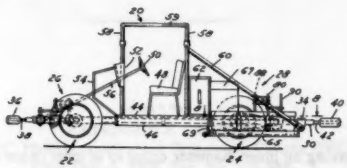
U.S. Cl. 180—65 R **7 Claims**

1. A motor vehicle including road engaging wheels and power means for driving at least one of said wheels and further including in combination with said wheels and power means:

an occupant compartment having a base structure forming a platform for the compartment and spaced apart flanges adjacent to the front and rear edges of the platform;

a pair of main frame members extending in spaced apart generally parallel relation for a substantial portion of the longitudinal dimension of the motor vehicle and lying in a plane so as to have a slidable fit through at least one of the downwardly directed platform flanges and extending at least part way toward the opposite platform flange; said main frame members supporting the occupant compartment and in turn being supported by the road engaging wheels;

means rigidly secured to that section of each main frame member under the compartment platform and forming a surface spacingly confronting at least one of the platform flanges; and



certain of the intervening spaces between the platform flanges and confronting surfaces of said rigidly secured means being substantially fully occupied by compressible energy absorbing material whereupon slidable movement of the platform relative to the frame members in the direction to compress such energy absorbing material will cushion the shock of a collision impact between the motor vehicle and an external object;

and means is provided for releasably holding the platform against sliding movement on the main frame members except in the event of a severe collision impact at which time the holding force will give way and permit the platform to slide longitudinally on the main frame members thereby compressing the energy absorbing material and absorbing part of the energy resulting from such an impact.

4,232,756

MOTOR-VEHICLE DRIVE-SHAFT ASSEMBLY

Hartmut Bathelt, Lenting, Fed. Rep. of Germany, assignor to Audi NSU Auto Union Aktiengesellschaft, Neckarsulm, Fed. Rep. of Germany

Filed Jun. 15, 1978, Ser. No. 915,605

Claims priority, application Fed. Rep. of Germany, Jun. 22, 1977, 2727966

Int. Cl.³ B60K *17/22*

U.S. Cl. 180—70 P **7 Claims**

1. A shaft assembly for interconnecting an engine and a load, said assembly comprising:

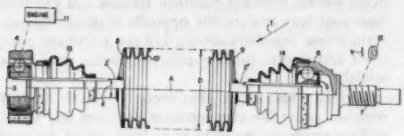
a small-diameter input shaft lying generally on an axis and having a pair of ends one of which is adapted to be connected to said engine and the other of which has a predetermined shaft diameter;

a small-diameter output shaft lying generally on said axis and having a pair of ends one of which is adapted to be connected to said load and the other of which has a predetermined shaft diameter;

respective rigid and radially outwardly tapering input and output flanges fixed on the other ends of said input and output shafts and extending radially outwardly therefrom; and

a large-diameter torque-transmitting and circumferentially corrugated tube centered generally on said axis and having axially spaced input and output ends respectively fixed

to said input and output flanges, said tube being elastically radially and axially deformable but said input and output ends being relatively angularly nondisplaceable, said tube



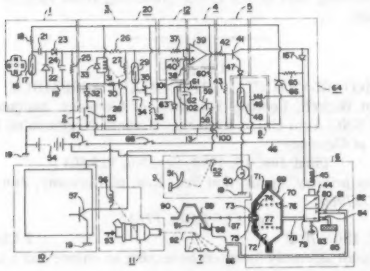
having an inner diameter equal to at least twice either of said shaft diameters and an outer diameter equal to at least three times either of said shaft diameters.

4,232,757

AUTOMOBILE SPEED CONTROL METHOD AND SYSTEM

Takeshi Ochiai; Masahito Muto, both of Toyota; Naoji Sakakibara, Chiryu, and Shoji Kawata, Okazaki, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed Apr. 27, 1978, Ser. No. 900,623
Claims priority, application Japan, Apr. 28, 1977, 52/49438
Int. Cl.[2] B60K *31/00*
U.S. Cl. 180—176 **7 Claims**



2. An automatic speed control system for an automobile having a fuel injection engine and a throttle valve, and comprising:

a speed signal generator circuit which generates a first electrical signal indicating actual automobile speed;

desired automobile speed signal supply circuit means which supplies a second electric signal indicating desired automobile speed in response to a speed set operation of the automobile driver;

an electronic fuel injection control device which produces a fuel injection control signal;

a feedback signal generator circuit which generates a third electric signal indicating fuel injection rate in response to the fuel injection control signal from the electronic fuel injection control device;

a comparator circuit combining said first, second and third signals to provide an engine throttle valve control signal; and

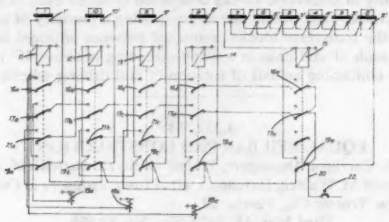
servomotor means for driving the throttle valve in response to the throttle valve control signal.

4,232,758

ELECTROMECHANICAL ANTI-THEFT SYSTEM FOR AUTOMOBILE VEHICLE

Pedro B. Crosas, Calle Agudas No, 32, Gerona, Spain

Filed Apr. 27, 1978, Ser. No. 900,502
Claims priority, application Spain, May 4, 1977, 459146
Int. Cl.[2] B60R *25/08*
U.S. Cl. 180—287 **3 Claims**



1. An electromechanical anti-theft system for an automobile vehicle having piping forming a brake line, a clutch line and a fuel line, the system comprising

three unidirectional solenoidal electrovalves for being situated in the piping of the brake line, the clutch line and the fuel line of the automobile vehicle, respectively;

a plurality of first control electromechanical relays each having a relay, each control relay except for a last control relay of said plurality of control relays winding and at least three normally open contact switches ;

a second control relay having a winding and at least two normally open contact switches;

an interlocking electromechanical relay having a relay winding, at least two normally closed contact switch means, and one normally open contact switch means;

means for connecting the system to an electrical power source;

series circuit means connected with the three electrovalves across the power source connecting means;

said series circuit means including at least one of said normally open contact switches of each of the first and second control relays and one of said normally closed contact switch means of the interlocking relay;

a second of said normally open contact switches of each of said first and second control relays connected in a respective series holding circuit including the corresponding relay winding and the second normally closed contact switch means of the interlocking relay across the power source connecting means;

said normally open contact switch means of the interlocking relay connected in series with the relay winding of the interlocking relay across the power source connecting means;

a plurality of first normally open push button switches corresponding to the plurality of control relays;

one of said first push button switches connected in a series circuit including the relay winding of the corresponding relay, and the second normally closed contact switch means of the interlocking relay across the power source connecting means;

each of the other first push button switches connected in a respective series operating circuit including the corresponding relay winding, the third normally open contact

switch of the respective preceding first control relay, and the second normally closed contact switch means of the interlocking relay across the power source connecting means; and

a plurality of second normally open push button switches all connected in parallel with each other and in series with the relay winding of the interlocking relay across the power source connecting means.

4,232,759

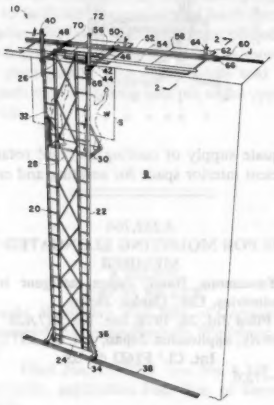
MOBILE LADDER-SCAFFOLDING SYSTEM

Ronald S. Jacobs, 1953 Hill Ave., Baltimore, Md. 21234

Filed Aug. 2, 1979, Ser. No. 63,078

Int. Cl.³ E06C *1/397, 5/00, 9/12;* E04G *3/14*

U.S. Cl. 182—39 **15 Claims**



1. In a system of mobile scaffolding including vertical structure with a plurality of ladders and means mounting the plurality of ladders movably as a unit on a bottom track for shifting location along the wall of a build- having roof structure, a work platform in said system having means for engaging rung structure of said ladders, and lateral means engaging the roof of the building to stabilize the vertical structure, the improvement comprising: at least one vertical track member on an upper portion of a said ladder, the lateral means including: horizontal track structure, means for fixing the horizontal track structure to a roof, a vehicle, first movable captive-engagement of the vehicle with the vertical track member, and second movable captive-engagement of the vehicle with a portion of the horizontal track structure.

4,232,760

LADDER ASSEMBLY AND METHOD OF MAKING SAME

George L. Becht, Orchard Park; Jerome A. Melachowski, Williamsville, and Richard J. Wolicki, Buffalo, all of N.Y., assignors to Buffalo Brake Beam Company, Lackawanna, N.Y.

Continuation-in-part of Ser. No. 774,586, Mar. 7, 1977, abandoned. This application Apr. 17, 1978, Ser. No. 896,791

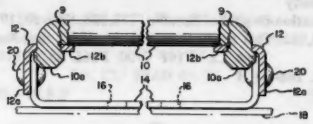
Int. Cl.² E06C *5/24, 7/08, 7/50*

U.S. Cl. 182—194 **2 Claims**

1. A ladder having a plurality of rungs comprising:

a pair of metal styles, each style having a front planar face and a rear planar face disposed parallel to the rungs and having a plurality of rung receiving apertures so disposed that corresponding rung receiving apertures on each style are vertically aligned, and

a plurality of rungs disposed between said styles, each of said rungs consisting of a rod of cold working steel, the ends of said rods bent at substantially a 90° angle about an axis defined by a generally arcuate indentation forming the inside radius of said angle, the main body portion of said rods abutting the front planar face of said styles, the ends of said rods extending through the apertures of said styles



and secured therein by a cold formed head of greater dimension than said aperture, said head abutting the rear planar face of said styles.

4,232,761

EXTENSIBLE LADDER

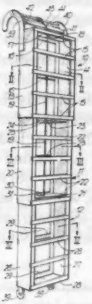
Reginald C. Phillips, Tracy, New Brunswick, Canada (E0G 3C0)

Filed Dec. 5, 1978, Ser. No. 966,588

Claims priority, application Canada, Jan. 6, 1978, 293801

Int. Cl.² E06C *1/36, 1/397*

U.S. Cl. 182—195 **4 Claims**



1. An extensible ladder of the type having a plurality of sections slidably received within one another and having each a pair of side pieces and a plurality of rungs extending therebetween;

one of said sections being a normally upper section and having a normally top end;

hook means secured to said normally upper section and protruding upwardly and away from a plane generally defined by said side pieces, for securing said upper section to an object to suspend the ladder;

cord means having one end secured to a normally lowermost section of the ladder, the other end of said cord means being secured to manually operable reel means disposed in proximity of said top end of the upper section and secured to same;

wherein a bottom end of said normally lowermost section is provided with supporting wheels pivotable about an axis generally parallel with the rungs of said ladder, the periphery of said wheels protruding both downwardly beyond the bottom end of the ladder, and out of a plane generally coincident with the sidepieces of the ladder, the sense of the latter protruding being the same as that of the hook means.

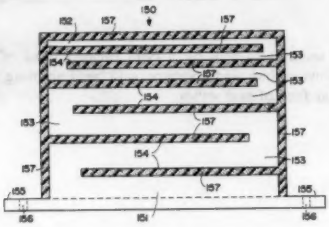
4,232,762
WIDE-BAND VIBRATION DAMPER

Oskar Bschorr, Munich, Fed. Rep. of Germany, assignor to Messerschmitt-Bolkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 722,128, Sep. 10, 1976, Pat. No. 4,120,382. This application Jul. 24, 1978, Ser. No. 927,388

Int. Cl.³ F16F 7/00; F16L 55/02

U.S. Cl. 188—1 B **22 Claims**



1. A wide-band vibration damper for damping sound propagating in a solid body, comprising sound vibration conductor means, the entire volume of which is solid material, said sound vibration conductor means having a first larger end and a second smaller end, said first larger end having a larger dimension than said second smaller end, whereby said solid material volume has a cross-section which diminishes from said first larger end to said second smaller end, said first larger and second smaller end being interconnected entirely by said solid material so that sound vibrations travelling from said first larger end to said second smaller end must travel entirely through said solid material volume, first means connecting said first larger end to said solid body for introducing sound vibrations into said solid material volume, support means located near said second smaller end, and damping material means operatively connecting said second smaller end to said support means for introducing sound vibrations in a damped manner into said support means, whereby said vibration conductor due to its diminishing cross-section transforms the sound vibrations into large excursions but small vibration forces.

4,232,763
FULL-COAT DISK BRAKE

Hermann Klaue, Tour d'Ivoire 24 e, 1820 Montreux, Switzerland

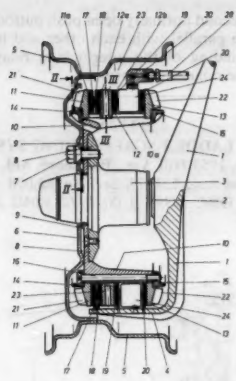
Filed Oct. 26, 1978, Ser. No. 955,143

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1977, 2748195

Int. Cl.³ F16D 55/10

U.S. Cl. 188—18 A **11 Claims**

1. A fully coated disk brake comprising: a disk-shaped brake housing carrier fastened to rotatable means and revolving therewith; a brake housing seated on said brake housing carrier and open radially towards the outside; braking means with a friction coat and fixed in a peripheral direction, said braking means being axially displaceable; tightening means for pressing together said braking means during a braking action; carrier arms distributed over the periphery of said brake housing carrier and extending in an axial direction; said carrier arms mounting said braking means and having abutments restricting axial movement of said braking means; and radially outward running air passage channels between said braking means for admitting cooling air between said carrier arms into said brake housing and onto said braking means; said braking means being fully free within said rotatable means; said carrier arms being spaced at predetermined intervals from each other for admitting an adequate supply of cooling air, said rotatable means having sufficient interior space for aerating and cooling.



4,232,764
APPARATUS FOR MOUNTING ELONGATED ROD-LIKE MEMBER

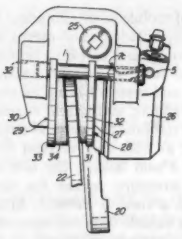
Masachika Yamamoto, Itami, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jul. 24, 1978, Ser. No. 927,425

Claims priority, application Japan, Jul. 25, 1977, 52-89466

Int. Cl.³ F16D 65/02

U.S. Cl. 188—73.6 **9 Claims**



6. In a disc brake apparatus for a motor vehicle including a brake disc mounted on an axle of said motor vehicle rotatably with a wheel, a bake housing positioned to straddle over said brake disc, and a pair of brake pads mounted on said brake housing and positioned at opposite sides of said brake disc so as to be caused to bear frictionally against said brake disc in opposite directions upon braking, and an apparatus for mounting a pin on said brake housing to support said brake pads comprising: an axial bore formed in said pin at one end portion thereof at which said pin is mounted on a supporting plate of said brake housing, said supporting plate being formed with a hole through which said pin extends, a stop means formed at an extremity of said pin for bearing against a corresponding surface of said supporting plate when said pin is fully inserted through said hole formed in said supporting plate, at least one radial throughhole extending from the inside of said axial bore outwardly and substantially perpendicularly to the longitudinal axis of said pin, said radial throughhole being formed at a position spaced from said stop means by a distance slightly greater than the thickness of said supporting plate, and a latch spring of a hairpin-like configuration having two spring legs,

one of which has a main leg portion, an intermediate leg portion and a free end portion, said free end portion being bent so as to extend substantially perpendicularly to said main leg portion and having a length to extend through said radial throughhole upon insertion of said latch spring into said axial bore and to project outwardly for a certain distance to engage a side surface of said supporting plate under spring force of said latch spring, said intermediate leg portion being bent both away from the other of said spring legs and relative to both said main leg and free end portions to facilitate insertion and removal of said free end portion into and from said radial throughhole, said latch spring further including a bent head portion between said two spring legs, said head portion having a size greater than the diameter of said axial bore so that said head portion is located externally of said axial bore in position to be grasped and compressed to move said spring legs toward each other to facilitate removal of said latch spring from said axial bore after said latch spring has been placed in said axial bore at latch position, whereby said pin is mounted on said supporting plate axially immovably while said pin supports said brake pads movably along said pin at the opposite sides of said disc brake.

4,232,765

DRUM BRAKE

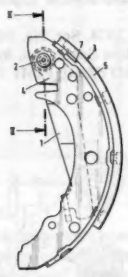
Kurt Rupprecht, Wolfsburg, Fed. Rep. of Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

Filed Jan. 17, 1979, Ser. No. 4,218

Claims priority, application Fed. Rep. of Germany, Feb. 6, 1978, 2804938

Int. Cl.³ F16D 65/09

U.S. Cl. 188—78 **2 Claims**



1. In a drum brake including a bake shoe having a web, a hand brake lever pivotally attached to the brake shoe by a rivet extending through the hand brake lever and the web and having a stepped rivet shaft formed of adjoining first and second rivet shaft portions, a spring disc mounted on the rivet shaft to compensate for a play between the web and the hand brake lever; the improvement wherein said spring disc is situated between said hand brake lever and said web and is firmly riveted to said web by said first rivet shaft portion passing through said hand brake lever; said spring disc having a central radial annular portion of an outer diameter which is greater than the diameter of said firs. rivet shaft portion; said spring disc further having at least one radial spring tab starting at the end of said outer diameter and extending out of the plane of said central radial annular portion of said spring disc.

4,232,766

SELF-ADJUSTING DRUM BRAKE

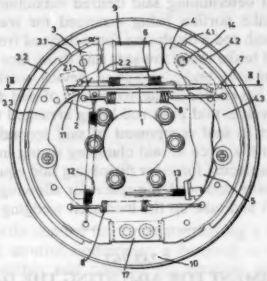
Kurt Rupprecht, Wolfsburg, Fed. Rep. of Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

Filed Oct. 3, 1977, Ser. No. 838,921

Claims priority, application Fed. Rep. of Germany, Oct. 2, 1976, 2644575

Int. Cl.² F16D 65/52

U.S. Cl. 188—79.5 P **5 Claims**



1. In a drum brake having a drum; first and second brake shoes arranged within the drum and provided with a brake lining oriented towards a drum face; a brake lever forming part of a parking brake and pivotally attached to the first brake shoe; return spring means continuously urging the brake shoes away from the drum face; a brake operating device having an actuated state in which the brake shoes are pressed, against the force of the return spring means, into frictional engagement with the drum face; the brake operating device having a released state in which an air gap is maintained between the lining of each brake shoe and the drum face; and a self-adjusting device operatively coupled to the brake shoes for automatically maintaining the air gap at a desired maximum value, the improvement in said self-adjusting device comprising

(a) a push rod of fixed length having opposite first and second ends; said return spring means urging said brake lever into operative abutment with said push rod at said first end thereof;

(b) an adjusting wedge having

(1) a first flank frictionally cooperating with a component forming a fixed part of said second brake shoe;

(2) a second flank frictionally cooperating with said push rod at said second end thereof; said return spring means urging said second brake shoe into operative abutment with said push rod with the intermediary of said adjusting wedge; said component of said second brake shoe and said push rod together defining a wedging space occupied by said adjusting wedge;

(3) a wedge angle defined by the inclination of said first and second flanks to one another; said wedge angle being of a magnitude to effect self-locking of said wedge when frictionally engaged by said component of said second brake shoe and said push rod;

(c) a clamping spring being attached, at one end, to said second brake shoe and further being attached, at another end, directly to said push rod for pressing said component of said second brake shoe and said push rod into frictional engagement with said first and second flanks, respectively, of said adjusting wedge separately from the effect of said return spring means; the magnitude of said wedge angle, the friction coefficient between said first flank and said component forming a fixed part of said second brake shoe and the friction coefficient between said second flank and said push rod as well as the forces of said return spring means and said clamping spring being so selected as to effect an equilib-

rium between the forces normally exerted on said adjusting wedge; and

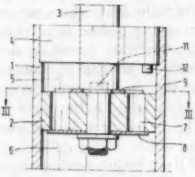
(d) an abutting and displacing means comprising a hook-like portion formed at said first end of said push rod; said hook-like portion projecting behind a part of said brake lever; said part of said brake lever being arranged to move towards said hook-like portion as said first brake shoe moves towards said drum face upon actuation of said brake operating device; in said released state said part of said brake lever and said hook-like portion define, between themselves, a clearance being identical to and determining said desired maximum value; said hook-like portion being arranged for transmitting to said push rod a displacing force derived from the travel of said brake shoes towards said drum face upon actuation of said brake operating device solely after said travel has exceeded the magnitude of said desired maximum value; said push rod being arranged to shift with respect to said component of said second brake shoe against the force of said clamping spring in response to said displacing force for dissolving said equilibrium and increasing said wedging space for allowing said wedge to shift and take up the increased wedging space.

4,232,767

ARRANGEMENT FOR ADJUSTING THE DAMPING FORCE OF A SHOCK ABSORBER

Cornelis De Kock, Oud-Beijerland, Netherlands, assignor to ITT Industries, Inc., New York, N.Y.

Filed Dec. 26, 1978, Ser. No. 972,908
Int. Cl.³ F16F *9/34*
U.S. Cl. 188—319 **1 Claim**



1. A hydraulic telescopic shock absorber having a cylinder closed by a cylinder cap and filled with a damping medium in which a piston having a piston head and a piston rod is reciprocatingly arranged, said piston head dividing the cylinder into two portions and further provided with a plurality of longitudinally extending and circumferentially spaced passages extending therethrough, the passage openings on the lower surface of the piston head being closed by a ring-shaped resilient valve, a rigid pie-shaped closing member coaxially and movably mounted about the piston rod on the upper surface of the piston head, said closing member including a longitudinally extending adjustment tab which engages an adjustment pin fixedly mounted to the lower surface of said cylinder cap, and wherein said passages are selectively opened or closed by extending the piston rod until said pin engages said tab and thereafter rotating the piston rod to expose the desired number of passages.

4,232,768

AUTOMATIC EMERGENCY BRAKE

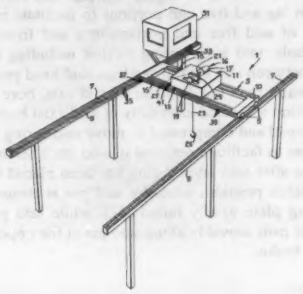
Jacques Dufresne, 6889 Lamont, Montreal, Quebec, Canada (H4E 2T8)

Filed May 1, 1978, Ser. No. 901,817
Int. Cl.² F16D *49/16*; B60K *41/20*
U.S. Cl. 192—2 **11 Claims**

1. An improved brake for a rotatable member mounted on a frame, comprising:

first and second support means mounted on the frame on both sides of the rotatable member, each support means carrying a brake and including means for pivotably attaching one of its ends to the frame, means for loosely attaching its other end to the frame, and means for mounting the brake on it intermediate its ends;

means on each support means for moving it relative to the frame to brake the rotatable member, said moving means comprising first and second brake frames pivotably connected to the support means at the loosely attached ends



thereof, spring means positioned between the brake frames and the support means for moving them apart to brake, and means for normally retaining the brake frames and support means together, against the force of the spring means, in a non-braking position; and

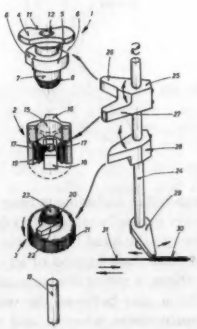
means for mechanically connecting the two support means together through the brake frames so that both of the brakes be operated by movement of only one of the support means if one of the moving means has failed.

4,232,769

RACKING MECHANISM FOR BOBBIN MACHINE

Juan C. Miró, Santa Maria de Barbara, Spain, assignor to Industria Espanola de Manufacturas Especiales, S.A., Barcelona, Spain

Filed Jan. 6, 1978, Ser. No. 869,033
Claims priority, application Spain, Jan. 8, 1977, 454.896
Int. Cl.² F16D *67/00*; F16H *57/10*
U.S. Cl. 192—4 R **12 Claims**



1. A bobbin-racking mechanism for a jacquard machine, said mechanism comprising:

a support;

a drive gear rotatable on said support about a drive axis;

a transmission member rotatable on said support independent of said drive gear about said drive axis;

an output member connectable to a bobbin and rotatable on

said support independent of said drive gear and transmission member about said drive axis;

an output gear fixed to said output member and spaced from said drive gear;

a transmission gear rotatable on said transmission member about a transmission axis transverse to said drive axis and meshing simultaneously with said drive gear and said output gear, whereby on rotation of said transmission member said transmission gear orbits about said drive axis;

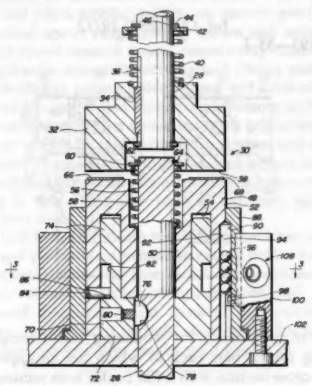
operator means engageable with said members and displaceable between a stopping position preventing rotation of said output member and permitting rotation of said transmission member and a racking position permitting rotation of said output member and preventing rotation of said transmission member; and a cam member connected to said drive gear and engageable with said operator means for displacing the latter from said racking into said stopping position.

4,232,770

DRIVE COUPLING

John J. Tuzson, Evanston, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Nov. 6, 1978, Ser. No. 957,788
Int. Cl.³ F16D *23/14*
U.S. Cl. 192—41 R **4 Claims**



1. An apparatus for drivingly connecting a driving shaft and a driven shaft comprising clutch means operatively associated with said shafts and means to actuate said clutch means, the improvement which comprises:

a first clutch member connected to said driven shaft for rotation therewith;

a second clutch member surrounding said driving shaft;

cam means connected for rotation with said driving shaft;

cam follower means connected to said second clutch member;

said cam follower having at least two positions with respect to said cam, one of which corresponds to coupled shafts and the other of which corresponds to uncoupled shafts; and

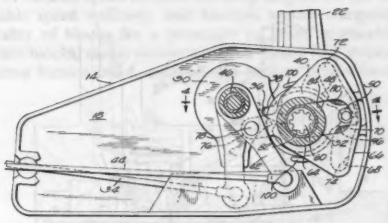
means to selectively actuate said cam and follower means comprising a one-way clutch associated with said second clutch member and providing a drag on said second clutch member upon reversal of the direction of rotation of said driving shaft thereby causing said cam follower to move from one cam position to another cam position.

4,232,771

SINGLE LEVER REMOTE CONTROL

Anthony P. Prince, Waukegan, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Continuation of Ser. No. 789,798, Apr. 22, 1977, abandoned.
This application Jan. 8, 1979, Ser. No. 1,486
Int. Cl.³ B60K *29/02*
U.S. Cl. 192—0.096 **10 Claims**



1. A throttle control for an engine having a throttle and a clutch, said control comprising a housing, a shaft member supported within said housing for rotation relative to said housing, a control lever connected to said shaft member for common rotation therewith relative to a neutral position, a shift lever mounted on said housing for movement between a neutral position and a shift position and adapted to actuate the engine clutch in response to movement of said shift lever, means connecting said shift lever to said shaft member for moving said shift lever from the neutral position to the shift position in response to rotational movement of said control lever from the neutral position, a throttle lever movable mounted on said housing and adapted to actuate the engine throttle in response to movement said throttle lever, a throttle drive member including a drive pin mounted on said shaft member for common rotation therewith in response to movement of said control lever from the neutral position, a cam member carried by said shaft member and connected between said throttle lever and said throttle drive member for movement between an idle position and a throttle advance position in response to rotation of said throttle drive member, said cam member including a cam track receiving said drive pin and having a shape effective to displace said cam member relative to said shaft member and to said throttle drive member to move said throttle lever in response to rotation of said throttle drive member, and guide means on said cam member and on said shaft member for guiding translatory movement of said cam member relative to the rotational axis of said shaft member in response to movement of said drive pin in said cam track.

4,232,772

ELECTROMAGNETICALLY CONTROLLED, RESETTABLE HIGH-SPEED SHAFT DISCONNECT

George E. Brissey, and Glen E. Gathers, both of Erie, Pa., assignors to General Electric Company, Wilmington, Mass.

Filed Jan. 5, 1978, Ser. No. 867,113
Int. Cl.² F16D *11/04, 27/10, 43/25*
U.S. Cl. 192—114 R **4 Claims**

1. In a resettable disconnect adapted to connect driving and driven members in a power transmission system, the combination comprising,

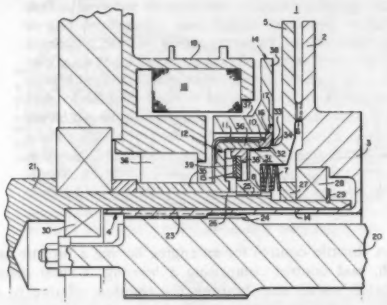
(a) a disengagable spring loaded, torque transmitting coupling disposed between the driving and driven members, said coupling having an axially moveable member and an axially fixed member;

(b) means for maintaining said axially moveable and axially fixed members engaged to transmit torque through said coupling, including;

1. radially moveable means having a tapered surface for contacting a tapered shoulder on the axially moveable coupling member to exert axial force on said axially

moveable member to maintain it in engagement with said axially fixed member against the separating force of spring loaded coupling,

2. cantilever spring means supporting said radially moveable member to allow centrifugal force to flex said spring and move said means with tapered surface radially outward and along the said tapered shoulder,
3. latching means to prevent said spring means from flexing outwardly thereby maintaining the radially move-



able means in contact with said axially moveable member;

(c) means responsive to a malfunction or incipient malfunction in the system to disable the latching means to permit flexing of said spring means and movement of the tapered face of said radially moveable means outwardly and along the tapered shoulder on said axially moveable member in response to the separating force of said spring loaded coupling to release said coupling and terminate torque transmission.

4,232,773

SAFETY DEVICE FOR MECHANICAL ECCENTRIC CAM PRESSES

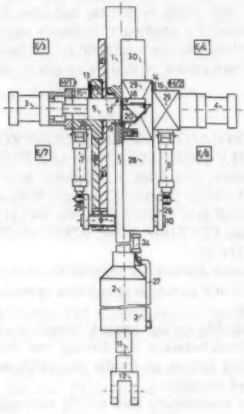
Renzo Cipriani, Fontanelle 52/d St., Fabriano, Italy

Filed Mar. 1, 1978, Ser. No. 882,420

Claims priority, application Italy, Mar. 14, 1977, 611 A/77

Int. Cl.[2] F16P *3/18*

U.S. Cl. 192—131 R **9 Claims**



1. A safety device for a mechanical cam press including a frame and a ram having dies arranged for vertically reciprocating strokes comprising, in combination, a vertically extending shaft, a double acting hydraulic cylinder having a piston rod connected at its upper end to the lower end of said shaft and at its lower end to the ram of the press whereby said shaft, said cylinder, and piston rod and said ram move together reciprocally as a unit, said shaft having a portion of reduced diameter forming a stepped edge, a pair of opposed, independent, horizontally moveable slides arranged for reciprocating movement between an advanced position and a retracted position, a pair of pneumatic cylinders operated by control means, means for connecting each of said pneumatic cylinders to one of said slides for moving the said slides reciprocally in opposite directions, said slides in said advanced position having a portion in underlying relationship with said shaft stepped edge with a clearance of a few millimeters in the top, dead center position of said shaft to thereby prevent the inadvertent downward movement of said shaft and therefore said ram by engagement between said stepped edge for said portions of said slides; and an interlock means, releasably engageable with said shaft for retaining said shaft in an initial position to permit vertical adjustment of said ram.

4,232,774

SET OF COMPONENTS FOR PRODUCING VARIABLE LOAD-BEARING SCAFFOLDS

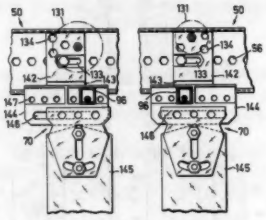
Rolf Gunti, Laufen, Switzerland, assignor to Masyc A.G., Laufen, Switzerland

Division of Ser. No. 827,213, Aug. 24, 1977, Pat. No. 4,172,677, which is a division of Ser. No. 608,399, Aug. 27, 1975, Pat. No. 4,056,180. This application Jun. 7, 1979, Ser. No. 46,178

Claims priority, application Switzerland, Aug. 27, 1974, 11677/74

Int. Cl.[3] B65G *39/12*

U.S. Cl. 193—35 J **3 Claims**



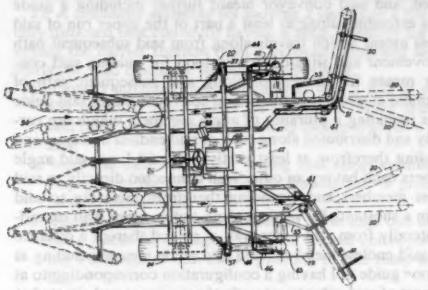
1. A set of components for producing load-bearing scaffolds comprising profile bars each of which has an approximately Σ-shaped cross-section with a flat center web section and two equally dimensioned flanges arranged in mirror image relationship, each of said center web sections and an inwardly angled free arm of each flange, which arm extends parallel to the center web section, being provided with perforations; connecting bars each of which has cross-section which is geometrically approximately similar to that of the profile bars with a center web section and two equally dimensioned flanges arranged in mirror image relationship and has such dimensions that a one of said connecting bars is slidably insertable into a one of said profile bars with engaging and fitting flanges at mutual superposed center web sections, the center web section of each of the connecting bars being provided with perforations, said profile and connecting bars being mutually detachably connectable by connecting means located through mutually superposed perforations; and bearing hole plates provided for supporting rollers of various envelope diameters, each of which bearing hole plates has a hole plate element attachable to the inside face of the center web section of a connecting bar and which hole plate has a fixing slot and series of bearing perforations arranged at various separations from the fixing slot to provide for various bearing heights.

4,232,775

STRUCTURAL AND OPERATIONAL IMPROVEMENTS FOR A TWO ROW HARVESTER AND PILER

Richard A. Duncan, 123 Len Ct., Thibodaux, La. 70301

Filed Sep. 22, 1978, Ser. No. 945,157
Int. Cl.³ A01D 45/10
U.S. Cl. 198—304 6 Claims



1. In a four-wheel harvester and pilers, having a right rear carrier frame member, sequential pairs of cane-moving chains, and a power train with hydraulic means for driving said chains and wheels and pilers,

(a) individual suspension means for independently mounting rear wheels on said harvester and pilers to provide harvester and pilers mobile stability on uneven ground

(b) individual speed range setting means and unitary mechanical speed control means respectively connected to said hydraulic means for driving said chains and wheels for individually setting speed ranges and controlling the speed within any of said ranges of said chains and wheels,

(c) single articulation piler means mounted behind and above said four wheels on said harvester and pilers and operably connected to said hydraulic means, and having longitudinally adjustable rub bar gate means fixed thereto for cooperating in side piling two rows of cut cane and center piling two rows,

(d) cane butt deflector means mounted on said harvester and pilers and pivotally adjustable to extend below and across said adjustable rub bar gate means for cooperating with said piler means in center piling two rows, and

(e) outward extension means fixed to said carrier frame member just forward of right rear wheel for providing additional fall space for center piled cane.

4,232,776

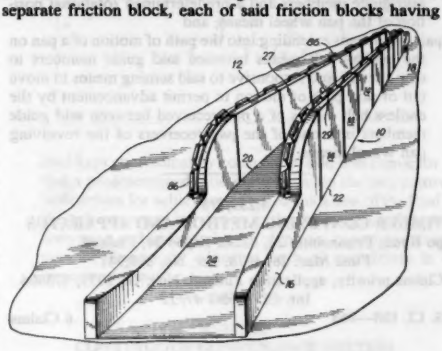
ACCELERATING WALKWAY

George A. Dean, Kansas City, Mo., assignor to Dean Research Corporation, Kansas City, Mo.

Filed Jan. 5, 1978, Ser. No. 867,111
Int. Cl.³ B65G 13/07
U.S. Cl. 198—322 11 Claims

1. A variable speed walkway comprising an acceleration section, a high speed section and a deceleration section, each of said sections comprising a plurality of rollers, each of said rollers in at least the acceleration and deceleration sections having a pulley thereon; a prime mover for each of said sections having an output shaft with a pulley thereon, means for individually and selectively varying the output speed of each of said prime movers; timing belt means in at least said acceleration and deceleration sections drivingly connected between the output shaft pulley and the pulleys of a selected number of said rollers in each of said sections; means for permitting passengers to enter said acceleration section, the rollers in said acceleration section being at rest during the passenger boarding operation, means for normally preventing passengers from entering said high speed section during passenger loading of said acceleration section and means for activating the prime movers in said acceleration section to accelerate passengers to the speed of said high speed section; sensor means adjacent the junction of said high speed section and said deceleration sections for sensing the arrival of a passenger at said deceleration section, and means for decelerating the rollers in said deceleration section to a selected exit speed beginning a selected time after the passenger is sensed by the sensor.

7. A variable speed handrail assembly adapted for use with a variable speed walkway, said handrail system comprising a plurality of blocks for a passenger to grasp, a plurality of friction blocks, means connecting each of said first blocks to a separate friction block, each of said friction blocks having a



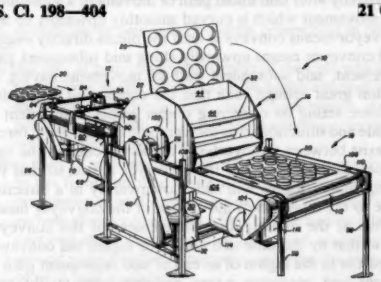
shaft extending therethrough, track means spaced apart on either side of said friction blocks, bearings on the end of each shaft engaging said track means, a plurality of rotatable means frictionally engaging said friction blocks and spaced along the path of said handrail for causing said friction blocks to move along said track means, a sheave mounted on each of said rotatable means, a prime mover having an output shaft and output sheave thereon and driving the sheaves on said rotatable means, belts drivingly connecting said output sheave and the sheaves connected to said rotatable means, the pitch diameters of the output sheave and the individual sheaves connected to said rotatable means being sized to move each friction block at the walkway speed at the location of said rotatable means.

4,232,777

PAN INVERTING APPARATUS AND METHOD

Jimmie L. Smith, Plano; John D. Honeycutt, McKinney, and Michael J. Dobie, Lewisville, all of Tex., assignors to Stewart Engineering & Equipment Company, Richardson, Tex.

Filed Sep. 5, 1978, Ser. No. 939,652
Int. Cl.³ B65G 47/24
U.S. Cl. 198—404 21 Claims



1. Apparatus for inverting pans, trays or the like, comprising:

revolving pan wheel means including structure defining a plurality of pan receivers;

input means comprising endless belt means mounted for rotation about a course including a portion adjacent to one side of the revolving pan wheel means and responsive to rotation of the pan wheel means for engaging and selectively advancing a pan to be inverted into one of said pan receivers for rotation therewith through approximately a one-half revolution to effect inversion;

output means for engaging and advancing inverted pans out of the pan wheel means;

a pair of pan guide members mounted in spaced relationship above said endless belt;

sensing means for detecting the presence of a pan between said guide members and a predetermined rotational position of the pan wheel means; and

pan stop means extending into the path of motion of a pan on the endless belt means between said guide members to stop the pan and responsive to said sensing means to move out of said path of motion to permit advancement by the endless belt means of a pan received between said guide members into one of the pan receivers of the revolving pan wheel means.

4,232,778

TIMBER-CONVEYING METHOD AND APPARATUS

Alpo Rysti, Frisansintie 22, 02240 Espoo 24, Finland

Filed Mar. 28, 1978, Ser. No. 890,941
Claims priority, application Finland, Nov. 18, 1977, 773504
Int. Cl.[2] B65G *47/12*
U.S. Cl. 198—443 **6 Claims**

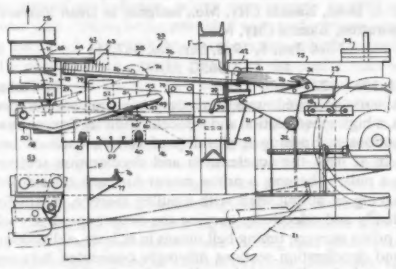
1. In an apparatus for conveying timber in a manner which will disperse a batch of timber pieces into individual timber pieces which are conveyed one after the other, delivering means for delivering a batch of timber to a predetermined location, conveyor means situated in part at said predetermined location for receiving a timber batch delivered by said delivering means to said predetermined location, said conveyor means including for timber conveyed thereby an initial path of movement which has an inclination, if any, with respect to a horizontal plane which is small enough to convey with said conveyor means the timber batch from the predetermined location with a substantial number of timber pieces disposed in overlying relationship with and frictionally engaging those timber pieces which directly engage the conveyor means, and said conveyor means including for timber conveyed thereby after said initial path of movement a subsequent path of movement which is curved smoothly upwardly so that the conveyor means conveys at least the pieces directly engaging said conveyor means upwardly along said subsequent path of movement, said subsequent path of movement having an inclination great enough such that the component of gravitational force acting on overlying timber pieces is sufficient in magnitude and direction so as to overcome the frictional forces which exist between the overlying timber pieces and the timber pieces directly engaging the conveyor means so that the overlying timber pieces will slide downwardly in a direction opposite to the direction of movement of the conveyor means and arrive at the initial path of movement of the conveyor means, so that by the time said conveyor means has conveyed timber pieces to the region of an end of said subsequent path of movement said conveyor means conveys substantially only timber pieces which directly engage said conveyor means one after the other and wherein said conveyor means includes at least a pair of coextensive endless flexible members each in the form of an endless chain, belt, or the like, said endless flexible members being laterally spaced from each other and having upper runs extending along said initial and subsequent paths of movement and lower runs situated beneath said upper run, said conveyor means including rotary means respectively having axes of rotation transverse to said paths of movement and respectively situated at ends of said initial and subsequent path of movement which are distant from each other, said endless means extending around said rotary means and forming a loop having opposed ends where said rotary means are respectively located, and said conveyor means further including a guide means extending along at least a part of the upper run of said endless means which travels along from said subsequent path of movement and situated in said loop for guiding said conveyor means for movement along said subsequent path of movement at said upper run of said conveyor means said guide means including a plurality of angle members which are carried by and distributed along each of said endless members and extending therefrom at least partly into said loop, said angle members each having an outer wall connected directly to said endless members and extending therefrom inwardly to said loop in a substantially vertical plane and an inner wall extending laterally from said outer wall at an end thereof a distance from said endless members, and said guide means including at least one guide rail having a configuration corresponding to at least part of said subsequent path of movement and situated at the side of said inner walls of said angle members opposite from said lower run for cooperating with said inner walls of said angle members to guide said upper run of said conveyor means for movement along said subsequent path of movement, said endless members respectively having at said upper run of said conveyor means upper surfaces for engaging timber pieces and carrying at said upper surfaces a projection means which projects at least to a slight extent upwardly from said upper surfaces at said upper run of said conveyor means for engaging behind at least some of the timber pieces to prevent the latter from moving downwardly along said upper run of said conveyor means at said subsequent path of movement thereof, said projection means extending laterally beyond said endless members and having at said upper run of said endless conveyor means a lower surface directed toward said inner walls of said angle members, and said guide rail having a surface engaging said lower surface of said projection means for contributing to the guiding of said endless members.

4,232,779

INFEED ASSEMBLY AND A DISCHARGE ASSEMBLY FOR A CONVEYOR SYSTEM

Rouzas R. Khoylian, Belmont, Mass.; James R. Cowdery, Pelham, N.H., and David B. Park, Wilmington, Mass., assignors to Design & Process Engineering, Inc., Billercia, Mass.

Filed Aug. 13, 1979, Ser. No. 65,870
Int. Cl.[3] B65G *37/00*
U.S. Cl. 198—472 **29 Claims**



13. An infeed assembly for moving a carrier from a horizontally disposed first conveyor having a hook assembly for conveying the carrier thereon to a vertically disposed second conveyor, said infeed assembly comprising

a pivotally mounted ramp assembly having a pair of ramp tracks for guiding a carrier thereon, said ramp assembly being pivotally mounted about a pivot axis;

at least one cam means for lowering said ramp assembly in response to the hook assembly moving into a predetermined position; and

a releaseable latch assembly mounted on at least one of said ramp tracks for engaging with the second conveyor during a subsequent upward pivoting of said ramp assembly.

27. A discharge assembly for moving a carrier to a horizontally disposed first conveyor having a hook assembly for conveying the carrier thereon from a vertically disposed second conveyor, said discharge assembly comprising

a pivotally mounted ramp assembly having a pair of pivotally mounted ramp tracks for guiding a carrier thereon, said ramp assembly being pivotally mounted about a pivot axis;

at least one cam means for raising said ramp assembly in response to the hook assembly moving into a predetermined position; and

a releaseable latch assembly mounted on at least one of said ramp tracks for engaging with the second conveyor during a subsequent downward pivoting of said ramp assembly.

4,232,780

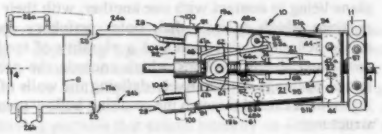
CONFECTION CONVEYOR

Stephen D. Cross, Fremont, Calif., assignor to FMC Corporation, San Jose, Calif.

Filed Jun. 4, 1979, Ser. No. 45,041

Int. Cl.³ B65G *47/86*

U.S. Cl. 198—479 **7 Claims**



7. An improved carriage for a transfer conveyor adapted to transfer products, such as frozen confections, from a first area to a second area, said carriage including a carriage frame, a pair of tong-receiving arms, a tong mounted to the end of each arm, each arm being pivotally connected at its rear end to said carriage frame so that the arms are mounted in opposed relationship to pivot in a plane in a scissor-like manner, and means for detachably mounting the tongs to the outer ends of said arms including a spring clip fixed to the projecting end of each arm, each spring clip including a resilient wall extending in parallel spaced relationship to a fixed wall at the projecting end of the associated arm, and means associated with each arm and tong for pivotally interconnecting the tong and arm to permit the tong to rotate about an axis which is normal to said resilient wall fixed wall and parallel to the plane of motion of the arms and to be received therebetween, said resilient wall flexing to permit said tong to be snapped into alignment with said arm.

4,232,781

METHOD OF AND APPARATUS FOR OPERATING A DOSING ARRANGEMENT FOR GOOD AND POORLY FLOWING LOOSE MATERIAL

Karl-Heinz Müller, Aachen, Fed. Rep. of Germany, assignor to Dr. Hans Boeckels GmbH & Co., Aachen, Fed. Rep. of Germany

Filed Jun. 21, 1977, Ser. No. 808,549

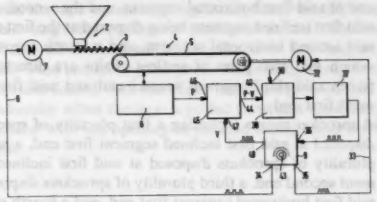
Claims priority, application Fed. Rep. of Germany, Jun. 19, 1976, 2627669

Int. Cl.³ B65G *43/08*; G01G *11/12*

U.S. Cl. 198—505 **4 Claims**

1. In a method of operating a dosing arrangement, for good and poorly flowing loose material, having a dosing device with a controllable drive, a belt conveyor also with a controllable drive, and a gravimetrically operable measuring device provided with said belt conveyor, the improvement therewith which includes the step of:

adjusting at least one of said drives prior to the start of a dosing process so that the ensuing drive speed ratio between said drives results in predetermined thickness of



load kept approximately constant on said belt conveyor so that a predetermined ratio exists between the two controllable drives for achieving a desired thickness of the load of the belt conveyor in relation to the drive speed of the belt conveyor and independently of preset conveying thickness simultaneously adjusting both of said drives in an opposite manner.

4,232,782

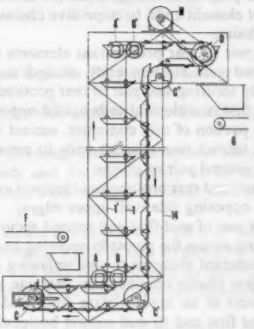
CONTINUOUS CONVEYANCE SYSTEM

Satoshi Ikeda, Tokyo, and Kouhei Shibata, Kitamoto, both of Japan, assignors to Shinko Kiko Co., Ltd., Tokyo, Japan

Filed Nov. 3, 1978, Ser. No. 957,579

Int. Cl.³ B65G *17/42, 17/48*

U.S. Cl. 198—706 **10 Claims**



1. A continuous conveyance system comprising in combination:

a plurality of conveyance containers of the kind which retain their shape in the absence of substantial external stresses, for conveying loose bulk, each conveyance container having a front and a rear portion, including opposing side walls having upper edges;

two pairs of endless spaced-apart chains respectively joined to the front and rear portions of each of said plurality of containers at said opposing side walls, said two pairs of endless chains comprising a first pair of endless chains for carrying the front portion of each said container and a second pair of endless chains for carrying the rear portion of each said container;

sprocket means for directing said two pairs of endless chains along a continuous path, said path including a plurality of successive segments, each segment having respective corresponding first and second ends whereby said endless chains are directed from said corresponding first ends to

said corresponding second ends, said plurality of segments including a first lower horizontal segment in which said endless chains are directed in a first horizontal direction, a first inclined segment in which said endless chains are directed in an upward direction and a second horizontal segment in which said two pairs of endless chains are directed in said first horizontal direction, the first end of said first inclined segment being disposed at the second end of said first horizontal segment, and the second end of said first inclined segment being disposed at the first end of said second horizontal segment, and a fourth segment in which said two pairs of endless chains are directed between said third segment second end and said first segment first end;

said sprocket means including a first plurality of sprockets disposed at said first inclined segment first end, a second plurality of sprockets disposed at said first inclined segment second end, a third plurality of sprockets disposed at said first horizontal segment first end, and a fourth plurality of sprockets disposed at said second horizontal segments second end, for directing said first and second pairs of endless chains in a first horizontal plane in said first horizontal segment and in a second horizontal plane in said second horizontal segment, and for directing said first pair of endless chains into a first inclined plane and directing said second pair of endless chains in a second inclined plane parallel said first inclined plane in said first inclined segment;

means for joining each of said conveyance containers to said first and second pairs of endless chains, said joining means including for each of said containers:

a pair of front protuberant elements having first and second front element ends, first means for respectively securing said pair of front protuberant elements at said first front element ends to said opposite sides of said front portion and first means for securing said second front element ends, to respective chains of said first pair of chains;

and a pair of rear protuberant elements having first and second rear element ends, second means for respectively securing said pair of rear protuberant elements at said first rear element ends to said opposing sides at said rear portion of said container, second means for fixing said second rear element ends to respective chains of said second pair of chains;

said front and rear protuberant elements extending beyond said opposing side wall upper edges;

at least one of said first and second securing means comprising means for pivotally securing one of said pairs of protuberant elements to said opposing side walls;

said endless chains continuously carrying said plurality of containers in an upright state from said first horizontal segment first end to said second horizontal segment second end.

4,232,783

STEP LINK FOR TRANSPORTATION APPARATUS

Joseph K. Kraft, Parsippany, N.J., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 19, 1979, Ser. No. 21,654
Int. Cl.³ B65G *17/38*
U.S. Cl. 198—851 **8 Claims**

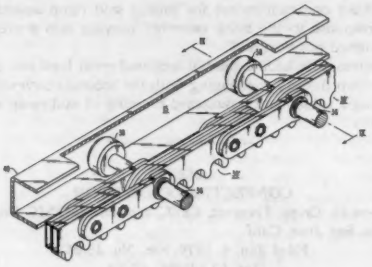
1. A toothed step link for interconnection with like step links via step axles to form an endless articulated belt for transportation apparatus, comprising:

first and second elongated elements of like construction having first and second ends, said first and second elongated elements being disposed in spaced relation with like ends adjacent to one another;

a third elongated element having first and second ends, said third elongated element having a plurality of teeth, said third elongated element having its second end disposed in the space between the first ends of said first and second elements;

said third element including at least one hollow metallic assembly formed of assembled right- and left-hand shell members, each of said right- and left-hand shell members having flat major wall portions formed of a metallic sheet having predetermined openings therethrough and a plurality of teeth along an outer edge, and including integral flange portions which extend outwardly from a common side of said flat major wall portion;

said flange portions including portions which encircle the outer periphery of said flat major portion, including said plurality of teeth, and portions which encircle the predetermined openings, with the ends of at least certain of said flanged portions lying in a common plane;



said right- and left-hand shell members being assembled with the ends of their flange portions which lie in a common plane being in contact with one another, with their flange portions which encircle their outer periphery cooperatively defining a side wall and a plurality of teeth, and with their flange portions which encircle the predetermined openings cooperatively defining the walls of openings which extend through the resulting hollow composite structure;

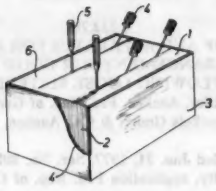
and means joining said first, second and third elements to provide an assembly wherein the first end of the third elongated element, and the second ends of the first and second elongated elements define male and female portions, respectively, for cooperating with female and male portions, respectively, of like assemblies.

4,232,784

STAND FOR INSTRUMENTS FOR MEDICAL USE

Sven-Gunnar Hesselgren, Kummelvägen 19, S-161 39 Bromma, Sweden

Filed Mar. 8, 1979, Ser. No. 18,627
Claims priority, application Sweden, Mar. 20, 1978, 7803160
Int. Cl.³ A61L *2/26, 2/06;* B65D *81/26;* C23F *11/00*
U.S. Cl. 206—210 **4 Claims**



1. A stand for maintaining and sterilizing metallic medical instruments comprising a casing including an upper open face, a bottom face, and a pair of sidewalls, and a plurality of sheets of liquid impregnatable paper arranged in said casing in face-

to-face contact so as to form a stack of sheets between said sidewalls of said casing with the sides of said stack of sheets communicating with said upper open face and said bottom face of said casing, said plurality of sheets of paper being impregnated with a corrosion inhibitor so that said instruments are insertable between said sheets from said upper open face of said casing in a manner such that said instruments may be stored therein, and further whereby the entire surface of said instruments inserted between said sheets in said casing is in contact with said sheets of paper impregnated with corrosion inhibitor and may be retained in such configuration during a sterilization process.

4,232,785

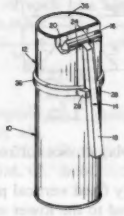
RAZOR STORAGE

Michael P. Lucas, Hingham, Mass., assignor to The Gillette Company, Boston, Mass.

Filed Jan. 31, 1977, Ser. No. 764,035

Int. Cl.³ B65D *69/00*; A45D *27/22*; B65D *85/00*

U.S. Cl. 206—228 **16 Claims**



1. A razor storage arrangement comprising a container having a dispensing opening at its upper end, a protective cover for removable securance to said container in protective position over said dispensing opening, and a razor having an elongated handle and a head at one end of said handle, said head having portions that extend laterally on either side of said handle for support of a transversely extending shaving edge, a recess in said cover for receiving the head of said razor with said handle extending downwardly below said cover along the side of said container, and structure integral with said cover and complementary with said razor for retaining said razor in releasably supported relation on said container.

4,232,786

CASE FOR A TAPE

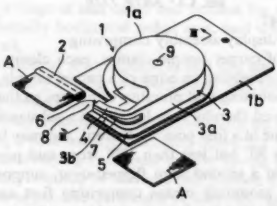
Kiyoshi Ogura, 1-7-203, 2-cho, Takeshirodai, Sakai-shi, Osaka-fu, Japan

Filed Apr. 10, 1979, Ser. No. 28,794

Claims priority, application Japan, Jul. 12, 1978, 53-96674[U]; Oct. 30, 1978, 53-149895[U]

Int. Cl.³ B65D *85/671*

U.S. Cl. 206—409 **5 Claims**



1. A package comprising:
a base sheet;
a cover fixed on said base sheet;
a roll of tape enclosed within said cover; and
a guide on said base sheet having a tangential portion extending from said case in a direction tangent to said roll, an end portion extending from the free end of said tangential portion and adjacent said cover and being open at the free end thereof, and a bend joining said tangential portion and said end portion, said end portion having a top wall inclined toward said base sheet from said bend to said open end, the tape extending tangentially from the roll through said tangential portion to said bend in the condition as drawn off said roll and having the inner face bent around said bend and having the portion extending along said end portion folded with the edges facing away from said roll, whereby when the tape is pulled from said open end, it is folded with the opening of the fold facing away from the roll.

4,232,787

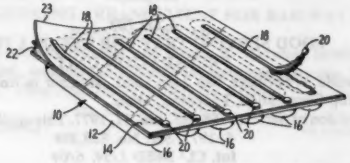
FOOD PACKAGING

Anne Holiday, 8620 Columbus, Sepulveda, Calif. 91343

Filed Apr. 2, 1979, Ser. No. 26,136

Int. Cl.³ B65D *85/20, 75/58, 77/32*

U.S. Cl. 206—443 **6 Claims**



1. A sealed package for holding a plurality of food units comprising:
a base receptacle with compartments for holding individual food units;
a lid piece for covering said base receptacle and each of said compartments and for maintaining in an airtight state individual food units within individual ones of said compartments;
and opening means associated with each of said compartments and forming a part of said lid piece for individually opening each of said compartments to remove food units without disturbing the integrity of the remaining compartments and
wherein said opening means comprising a beaded strip formed in said lid and extending along each of said compartments.

4,232,788

AUTO-EXPANSIBLE CUSHIONING BAG

Jacques Roth, 13, quai Mullenheim, Strasbourg (Bas-Rhin), France

Filed Jan. 31, 1979, Ser. No. 8,190

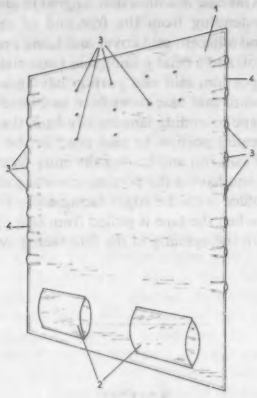
Claims priority, application France, Feb. 3, 1978, 78 03732; Dec. 14, 1978, 78 37019

Int. Cl.² B65D *81/02, 85/30*

U.S. Cl. 206—524 **7 Claims**

1. An auto-expansible cushioning bag, comprising a completely closed envelope of flexible, impervious and transparent

material, and at least two hermetically closed sachets, likewise of flexible, transparent and impervious material, which are



disposed in the envelope and contain the ingredients necessary for the production of a curable plastic foam.

4,232,789

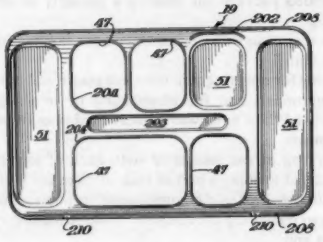
FOOD SERVING TRAY FOR USE IN A FOOD PREPARATION UNIT

Donald A. Springer, San Jose, Calif., assignor to Anchor Hocking Corporation, Lancaster, Ohio

Division of Ser. No. 758,455, Jan. 11, 1977. This application Oct. 4, 1977, Ser. No. 839,389

Int. Cl.³ B65D *1/34, 6/04*

U.S. Cl. 206—562 **17 Claims**



1. In a tray for use in a food preparation unit having a plurality of pairs of cantilevered support arms with a heater shelf secured to each pair of support arms and with the tray slidably positioned on each heater shelf, the tray comprising a generally flat element with a generally planar upper surface and with a leading wall and an oppositely disposed trailing wall and a pair of side walls opposite each other and intermediate said leading wall and said trailing wall, the improvement being said tray having at least one dish size opening extending through said element whereby a dish to be heated may be inserted therein and rest upon a heater on the heater shelf disposed beneath said tray, a raised edge around the perimeter of said upper surface along at least said leading wall and said trailing wall, and a pair of notches extending completely across said raised edge along said leading wall thereof and spaced inwardly from said side walls whereby said tray may be slid on the heater shelf and the pair of cantilevered support arms for the heater shelf thereabove may be disposed in said notches.

4,232,790

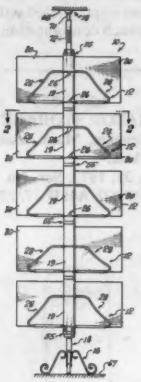
STORAGE AND DISPLAY DEVICE FOR RECORD ALBUMS AND TAPES

Rudy C. Serrano, 1739 N. Leafdale St., South El Monte, Calif. 91733

Filed May 11, 1977, Ser. No. 795,923

Int. Cl.² A47F *7/00*

U.S. Cl. 211—40 **10 Claims**



1. A storage-and-display device for record albums and tape cartridges comprising:

a central, substantially fixed vertical pole,

a base member secured to the lower end of said pole,

a plurality of rack means disposed one above the other in contiguous superposed relation arranged to removably store and display record albums and tape cartridges, including journal means for individual rotation of each rack means, each of said rack means comprising:

a cylindrical housing having a substantially solid cylindrical vertical wall coaxial with and rotatably supported on said fixed pole,

at least one wire frame support bracket having wire leg members removably secured to said housing to extend outwardly therefrom,

mounting means including apertures in said cylindrical housing wall to receive said bracket leg members, the wire frame support bracket providing a spring-retaining action between the bracket and the mounting means,

locking means disposed on said bracket to engage said mounting means, and

at least one support track member secured between the wire members and maintaining the members in spaced relation.

4,232,791

WATERFALL CARPET DISPLAY

Fred Howard, 500 10th Ave., New York, N.Y. 10018

Filed Jun. 17, 1977, Ser. No. 807,690

Int. Cl.² A47F *7/16*

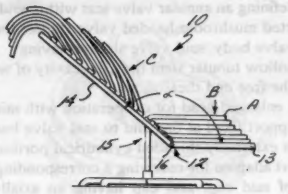
U.S. Cl. 211—47 **14 Claims**

1. A carpet display assembly comprising

a plurality of carpet sample clamps, each clamp including means for receiving an edge of a carpet sample, and

means for mounting said plurality of clamps so that all samples received thereby may lay flat in a substantially horizontal plane in a first position thereof, and may be pivoted more than 90° but less than 180° from said position and disposed in a second limp flipped-over, supported position, said mounting means comprising first and second substantially planar relatively rigid support members, said support members joined together along a co-operating edge of each, and said member making an angle α of greater than 90° with respect to each other; said mounting

means further comprising rod means affixed to, and having portions extending parallel to, said second support member, said rod means receiving said clamps for pivotally mounting said clamps with respect to said support members; and wherein said rod means include a plurality



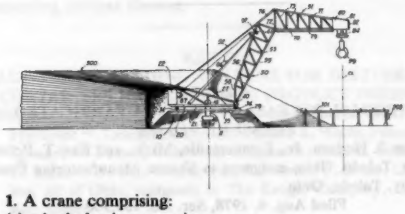
of spaced individual rod segments, disposed in pairs along the length of said second support member, each rod segment having a portion extending generally parallel to said second support member toward its paired rod segment, the rod segment of each pair having free ends that are spaced from each other.

4,232,792

CRANE

Dean W. Shields, Orangeburg, S.C., assignor to Kockums Industries, Inc., Talladega, Ala.

Filed Feb. 21, 1978, Ser. No. 879,444
Int. Cl.³ B66C 3/00
U.S. Cl. 212—160 **25 Claims**



1. A crane comprising:

(a) a body having a carriage;

(b) said carriage having a vertical axis, said carriage being rotatably supported for pivoting about said vertical axis;

(c) a circular continuous rail extending around said vertical axis below said carriage; the center of the circle of said rail coinciding with said vertical axis; said carriage extending in opposite directions from said center outwardly and over circumferentially spaced portions of said rail for providing one end portion of said carriage over one portion of said rail and the other end of said carriage over the other portion of said rail;

(d) circumferentially spaced wheels rotatably mounted on said carriage at said other end portion for rotation about substantially horizontal radial axes, said wheels riding on said rail;

(e) an additional wheel means at said one end portion about substantially a horizontal radial axis, said additional wheel riding on said rail;

(f) said body including an open frame dog leg truss assembly having a base section extending upwardly and forwardly from said carriage, said base section having a proximal end pivotally secured to said one end portion of said carriage and an upper end outwardly of said rail, said truss assembly having a generally horizontal boom section secured by one end to and extending outwardly from said upper end, the outer end of said boom section forming the distal end of said truss assembly;

(g) sheave means at the distal end of said truss assembly;

(h) a cable winch means at said other end portion of said carriage;

(i) cable means extending from the winch means upwardly and over said carriage and thence through said truss assembly adjacent to the distal end of said base section and thereafter through said horizontal section and over said sheave means;

(j) a grapple on the end portion of said cable means below said distal end;

(k) counterweight means over the end portion of said rail adjacent to said winch;

(l) flexible cables connected adjacent to said counterweight and said winch and to said truss assembly adjacent to the junction of said base section and said horizontal section for supporting said truss assembly from pivoting outwardly; and

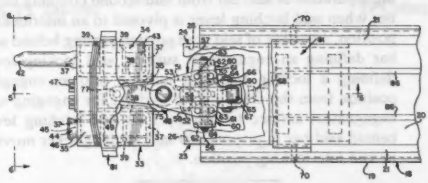
(m) pivot means between said carriage and said proximal end of said base section providing the pivotal securement therebetween.

4,232,793

CAR COUPLING ARRANGEMENT FOR RAILWAY PASSENGER CARS

Keith J. Hallam, Merrillville, and Dennis B. Marsden, Griffith, both of Ind., assignors to Pullman Incorporated, Chicago, Ill.

Filed Apr. 18, 1979, Ser. No. 31,241
Int. Cl.³ B61G 3/04
U.S. Cl. 213—43 **16 Claims**



1. An end of car coupling arrangement for railway cars including

a supporting frame mounted on the end of said car,

a coupler structure including a box-like housing having a coupler pin projecting outwardly therefrom,

said housing including a receptacle laterally spaced from said coupler pin for receiving the coupler pin of a connected car,

means slideably supporting said coupler structure on said supporting frame, the improvement comprising;

a shank connected to said coupler housing and projecting rearwardly therefrom,

a pivot support member slideably supported on said supporting frame,

upper and lower pivot lugs on said pivot support member,

a vertical pivot shaft supported on said lugs,

bearing means connecting said shank and coupler housing to said shaft for horizontal swinging movement from a center position about a vertical axis,

means pivotally connecting one end of said shank to said pivot support member whereby said shank and coupler housing may be swung vertically about said bearing means from said center position,

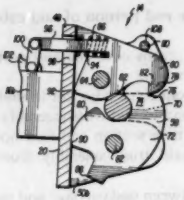
and biasing means for returning said coupler shank to said center position.

4,232,794

AUTOMATIC CAR COUPLER

Ronnie C. Plaster, Rte. 1, Box 23, Tazewell, Va. 24651

Filed Oct. 4, 1978, Ser. No. 948,374
Int. Cl.³ B61G *1/06*
U.S. Cl. 213—179 **18 Claims**



1. In a car coupler for coupling first and second adjacent cars together of a type comprising first and second coupling members respectively mounted on said first and second adjacent cars for interlocking with each other, the improvement wherein:

said first coupling member comprises an elongated coupling bar which is supported to have 360° of access thereabout;

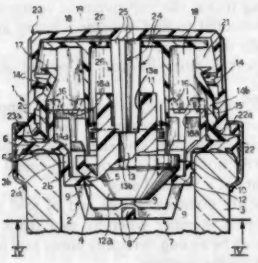
said second coupling member comprises a frame member having a latching lever and a locking lever pivotally mounted thereon at latching-lever and locking-lever pivot mounts, said latching-lever pivot mount having an axis which is approximately parallel to, but laterally spaced to one side of, said bar when said first and second coupling members are interlocked with each other, said latching lever forming a latching hook having a nose portion for passing behind said bar into a blocking position for blocking separation of said bar from said second coupling member when said latching lever is pivoted to an interlocking position, a portion of said nose portion passing behind said bar defining an engagement surface, said locking lever defining a locking hook for moving into an engaging position from the other side of said bar for engaging said engagement surface to thereby lock said latching lever behind said bar in response to said latching lever moving to said interlocking position.

4,232,795

NON-REFILLABLE BOTTLE CLOSURE

Nicola Vigna, Montecarlo, Monaco, assignor to Tradall S.A., Geneva, Switzerland

Filed Jun. 20, 1979, Ser. No. 50,254
Claims priority, application Switzerland, Jul. 4, 1978, 7294/78
Int. Cl.³ B65D *49/02*
U.S. Cl. 215—21 **5 Claims**



1. In a bottle closure device, for sealably closing and preventing fraudulent filling of bottles fitted therewith, comprising:

a valve body adapted to be inserted as a plug into the neck of a bottle;

an annular flange at one end of said valve body, adapted to abut against the end face of the neck of said bottle;

means defining an annular valve seat within said valve body;

an inverted mushroom headed valve shutter located within said valve body, said valve shutter having:

(i) a hollow tubular stem the axial cavity of which is open at the free end thereof, and

(ii) an enlarged head for cooperation with said valve seat;

a cap support fixed at one end to said valve body; and

a cap, an externally threaded cylindrical portion of said cap support adapted for receiving a correspondingly threaded part of said cap, said cap having an axially extending central pin provided with longitudinal ribs, which pin engages into said axial cavity of said stem of said valve shutter when said cap is screwed onto said cap support, the improvement wherein,

(a) said longitudinal ribs each have a sharp outer edge,

(b) said axial cavity in said stem of said valve shutter has, an inner part adjacent said mushroom head of said valve shutter having a circular cross section, and

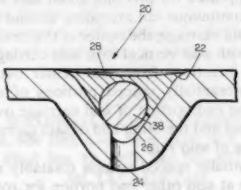
(c) the size of said ribs on said pin of said cap being such that, when said cap is completely screwed onto said cap support, the radius of the circular section of said inner part of the axial cavity, at any point along the axis of said inner part, is less than the radial distance between said sharp outer edges and the axis of said pin of said cap at that point.

4,232,796

THERMAL RELEASE PLUG FOR A FABRICATED PRESSURE VESSEL

Sharon J. Hudson, Jr., Lambertville, Mich., and Karl T. Petersen, Toledo, Ohio, assignors to Sharon Manufacturing Company, Toledo, Ohio

Filed Aug. 4, 1978, Ser. No. 930,900
Int. Cl.³ F16K *17/40*
U.S. Cl. 220—89 B **7 Claims**



1. A safety vent structure for a pressure vessel fabricated of sheet metal casing sections brazed together, said structure comprising: an inwardly converging generally frusto-conical well formed in the wall of one of said sections, a vent opening in the bottom of said well, a plug member in said well, said plug member having a circular periphery, said well having radially disposed plug standoff means for supporting said plug member at spaced locations around said periphery in contact therewith such that peripheral portions intermediate said locations are spaced from the adjacent inner surface of said well, and a low temperature fusible sealant bridging the space between said plug member periphery and said inner well surface.

4,232,797

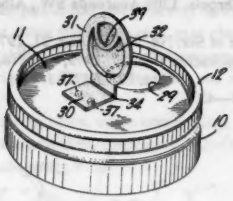
RECLOSABLE CONTAINER

Nelson J. Waterbury, 211 E. 70th St., New York, N.Y. 10021

Continuation-in-part of Ser. No. 908,141, May 22, 1978, Pat. No. 4,164,303. This application May 14, 1979, Ser. No. 38,948

Int. Cl.³ B65D *39/12, 41/32*

U.S. Cl. 220—359 **6 Claims**



1. In a container having a lid and a pour opening in the lid for the discharge of the contents of the container, an articulated closure for the opening comprising a mounting element on the lid adjacent the inner end of the opening, a relatively rigid closure element hinged to the mounting element for overlying the opening to seal the contents within the container, a lift element integrally formed with the closure element on the end opposite the mounting element and liftable relative to the closure element to break the seal and lift the closure element away from the lid along the hinged connection between the mounting and closure elements, depending means integrally formed from the underside of the mounting element to mount the mounting element to the lid and interlocking with the lid to prevent rotational movement of the mounting element relative to the lid, an opening in the lid to accommodate the depending means and enlargement means integrally formed on the depending means beneath the opening in the lid to anchor the mounting element thereon.

4,232,798

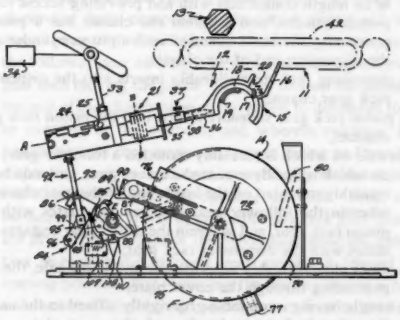
AUTOMATIC VENDING MACHINE FOR DELIVERING CONTAINERS HAVING EDIBLE PRODUCT THEREIN

Richard L. Hammel, Lima; Robert H. Schaefer, Lakeview; Frederick N. Lancia, Columbus; William A. Wolfe, Pataskala; Leonard F. Dearth, Columbus; Stephen L. Benton, Gahanna; H. Richard Homan, Westerville, and Arthur P. Bruce, Columbus, all of Ohio, assignors to The Kroger Company, Cincinnati, Ohio

Filed Mar. 29, 1978, Ser. No. 891,316

Int. Cl.³ G07F *13/10*

U.S. Cl. 221—12 **16 Claims**



9. An automatic vending machine for delivering items to be vended comprising an arm pivotally mounted to the machine for rotation about a generally vertical axis, said arm having an end thereof having item-holding means for receiving and holding items to be vended, and including spring biased releasable clamping means including lever means movable between a first and second position for releasing said clamping means; a delivery chamber having first and second alternately open and closed first and second doors, respectively, said first door blocking access to said delivery chamber from exterior of the machine and said second door blocking access from said delivery chamber to said arm; abutment means positioned so that said lever means is engageable with said abutment means when said item-holding means is within said delivery chamber; and receiving means so positioned in said delivery chamber to receive items being vended after release from said item-holding means; wherein the improvement comprises:

mechanical latching means for latching said first door in closed position until said arm item-holding means has been completely withdrawn from said delivery chamber after receipt of an item by said delivery chamber; and rod means operatively connected to said arm and said latch means for effecting unlatching of said first door in response to movement of said arm so that said first door is unlatched by said rod means after movement of said arm out of said delivery chamber; and wherein said first door includes means associated therewith for resetting said latching means to latch said first door after opening movement of said first door, at least past one-half open position, and removal of the item from said delivery chamber so that said first door is latched shut during movement of said arm into and out of said delivery chamber.

4,232,799

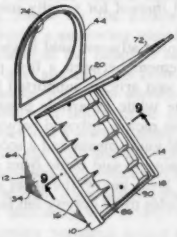
LOW PROFILE DISPLAY

Richard W. Housman, 3416 Manning Ave., Los Angeles, Calif. 90064

Filed Apr. 7, 1978, Ser. No. 894,228

Int. Cl.³ B65D *85/20*

U.S. Cl. 221—92 **19 Claims**



2. A vending device for the storage and display of articles of merchandise, comprising:

a housing having a plurality of vertical walls, one of said vertical walls extending longitudinally centrally of said housing, partitioning said housing into two substantially equal portions;

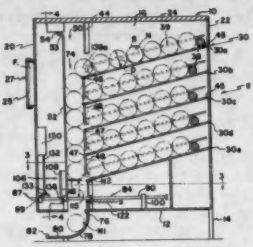
an array of bins in said housing, each bin for containing a plurality of articles of merchandise; and

a cover member comprising a base region and a plurality of projections extending outwardly from each side of said base region, said cover member being symmetrical about a centerline of symmetry of said base region and secured to the top edge of said centrally extending wall along said centerline of symmetry for partially overlying each of said bins, and at least one of said projections extending over a portion only of each of said bins, whereby to permit an article of merchandise to be withdrawn from a bin by upward movement of said projection thereover relative to said base region.

4,232,800
APPARATUS FOR DISPENSING ROLLED NEWSPAPERS AND THE LIKE

Dennis R. Martin, 2309 State St., Saginaw, Mich. 48602, and George O. Hopper, Jr., Saginaw, Mich., assignors to Dennis R. Martin, Saginaw, Mich.

Filed Apr. 16, 1979, Ser. No. 30,537
Int. Cl.[3] B65G 59/06
U.S. Cl. 221—109 15 Claims



1. Article dispensing apparatus for individually dispensing generally cylindrical articles, such as rolled newspapers, comprising:

at least upper and lower superposed, vertically inclined article supporting racks, each having an upper end and a lower end;

means mounting said racks at such an angle that articles supported thereon will travel, by force of gravity, toward said lower end;

vertically disposed article guide means, spaced from said lower ends of said racks, defining, with portions of said racks, a generally vertically disposed chute for receiving said articles from said racks and passing them downwardly in a stack; said chute having a discharge opening at the lower end thereof for serially passing the articles in said column;

stop means mounted adjacent said lower end of said lower rack for movement between a first position preventing movement of said articles supported by said lower rack into said chute while an article passing into said chute from said upper rack is disposed between said stop means and said article guide means and a second position, when all articles passing to said chute from said upper rack are disposed at a level below the level of said stop means permitting articles to be gravity fed from said lower rack to said chute;

gate means adjacent said discharge opening movable between a blocking position interrupting the downward passage of said column of articles in said chute and a non-blocking position permitting the articles to serially pass through said discharge opening;

stack support and divider means coupled to said gate means for movement therewith between a remote position, when said gate means is in said blocking position, permitting the downward passage of articles in said chute to said gate means and an operative position interrupting the passage of, and vertically supporting, the articles trailing the lowermost article when said gate means is in said non-blocking position such that only the lowermost article is dispensed through said discharge opening;

said gate means including barrier means, disposed in the path of said lowermost article when said gate means is in said blocking position;

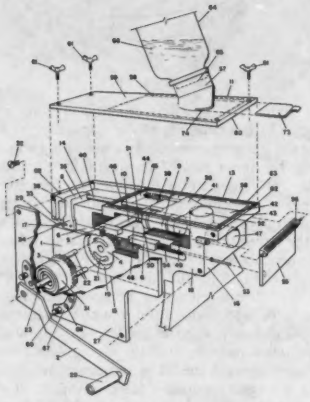
said barrier means having an opening therein receiving and passing said lowermost article when said gate means is in said non-blocking position; and

means adjustably mounting said stack support and divider means on said gate means in any selected one of a plurality of different vertical positions to selectively adjust the vertical distance between said barrier means and said divider means.

4,232,801
PORTION CONTROL DRESSING AND FOOD DISPENSER

George C. Chronis, 1309 Anaconda SW., Albuquerque, N. Mex. 87105

Continuation of Ser. No. 50,811, Aug. 21, 1978, abandoned. This application Dec. 17, 1979, Ser. No. 104,124
Int. Cl.[3] B67D 5/42
U.S. Cl. 222—43 2 Claims



1. A portion control dressing and food dispenser device comprising:

a chassis having a dispensing end, a butt end, a handle side, a top and a bottom, a blank side; said chassis having a gear chamber perpendicular to the handle side, and a dispensing rack gear channel, from the butt end to the dispensing end, and a piston rack gear channel from the butt end to the dispensing end, and a cylindrical piston cylinder from the butt end to the dispensing end, and a valve chamber in the top of the chassis; wherein the dispensing rack gear channel intersects the gear chamber, and the piston rack gear channel intersects the gear chamber; and wherein the dispensing rack gear channel has a slot along its length providing access to the handle side of the chassis; and wherein the piston rack gear channel has a slot along apart of its length connection with and providing access to the piston cylinder; and wherein the chassis has a passage connecting the valve chamber with a piston cylinder near the dispensing end of the chassis;

a dispensing rack gear slideably inserts into the dispensing rack gear channel,

a piston rack gear slideably inserts into the piston rack gear channel,

an axle on which is rotatably mounted a follower gear, and on which is fixedly mounted a driver gear, said axle being rotatably mounted on the inside end of the gear chamber, wherein the follower gear engages and mates with the piston rack gear, and wherein the driver gear engages and mates with the dispensing rack gear;

a cover plate rotatably supports one end of the axle, the axle protruding through the cover plate;

a handle having a rotatable grip rigidly affixed to the end of the axle which protrudes through the cover plate;

a rectangular flat slide valve slideably mates into the valve chamber, said slide valve having a sloping front end and a flat butt end; wherein a valve rod is rigidly attached to and perpendicular to the flat end;

the valve chamber having a lip, said lip having a semicircu-

lar seal recess in its top and a helical spring stop rigidly affixed to the inside of the lip adjacent to the flat end of the slide valve, and said valve chamber having a valve rod port sized to slideably accept the valve rod;

a piston crank, generally rod like, is rigidly attached on one end to the piston rack gear, and rigidly affixed on the other end to the piston rod and slideably functions in the lengthwise slot along the piston rack gear channel;

a valve arm is rigidly affixed to the dispensing rack gear on one end, and rigidly affixed on the other end to the valve rod;

a helical return spring bears, when compressed, against the dispensing rack gear and the dispensing end of the dispensing rack gear channel;

a resilient seal;

a container mount having a threaded container adapter with a mouth for passage dressings or food from a container into the valve chamber, said container mount being generally flat and having a semi-circular seal recess sized and shaped to accept the resilient seal and to sealably mate with the seal recess in the lip of the valve chamber, said container mount being rigidly affixed to the top of the chassis over the valve chamber, with a resilient seal between the container mount and the chassis and the container mount secured to the chassis as by screws;

a dispensing door, and a means for opening and closing the dispensing door driven by the dispensing rack gear,

the follower gear having a plurality of driver slots, said driver slots being circular arcs in shape having a width sufficient to slideably accept driver pins;

a plurality of driver pins being round rod like members, rigidly affixed to a face of the driver gear, of size and length to slideably insert in to the driver slots of the follower gear,

a graduated stop mount having a plurality of taps, the stop mount being generally flat, circular arc in shape, rigidly affixed to the handle side of the chassis adjacent to the handle,

a stop bolt threaded to screw into the taps in the stop mount, and

a container, threaded at the mouth to screw mateably on to the container adapter,

wherein by turning the handle, the driver gear moves the dispensing rack gear, closing the slide valve, opening the dispensing door, compressing the return spring and further turning of the handle causes the driver pins to engage the follower gear causing it to turn, the turning follower gear then moving the piston rack gear toward the dispensing end of the chassis causing the piston to discharge food or dressing in the cylinder; and wherein releasing the handle permits the compressed return spring to force the dispensing rack gear toward its starting position closing the dispensing door, and opening the slide valve; and further rearward travel of the dispensing rack gear causes the driver pins to slide in the driver slots until the driver pins re-engage the follower gear moving it toward its starting position thus retracting the piston causing a partial vacuum in the cylinder which causes food or dressing to move from the container into the valve chamber, through the passage into the cylinder; and wherein movement of the dispensing rack gear is stopped by the handle contacting the stop bolt; and wherein the invention is ready for the next turn of the handle.

4,232,802

APPARATUS FOR PULSEWISE DISPENSATION OF VERY SMALL AMOUNTS OF LIQUID, PARTICULARLY H_2O_2

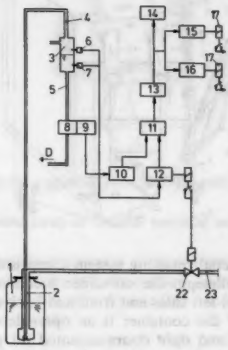
Gerhard Buschmann, Düsseldorf, Fed. Rep. of Germany, assignor to Jagenberg-Werke Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Dec. 21, 1978, Ser. No. 971,778

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1977, 2757897

Int. Cl.³ B67D *5/08*

U.S. Cl. 222—56 **3 Claims**

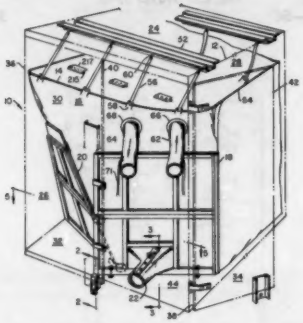


1. In an apparatus for the pulsewise dispensing of very small amounts of liquid controlled with a measuring instrument comprising ejecting means for the pulsewise ejection of a desired amount of liquid, a measuring vessel having a volume greater than the volume of the liquid to be ejected for each pulse and having an inlet and an outlet connected to the ejecting means and wherein the cross section of the vessel is adapted to the amounts of liquid to be controlled, sensing means having an upper and a lower sensing device positioned at said vessel between the inlet and the outlet and defining a refill volume therebetween and responsive to the level of the liquid therein for generating a signal when the upper and lower sensing devices are activated, and a reservoir of liquid, the improvement comprising pumping means responsive to the sensing means for supplying a substantially constant amount of liquid from the reservoir to refill the vessel independent of the liquid level in the reservoir, the pumping means comprising a neck portion and a foot portion having an inlet at the bottom thereof, a feed line to the measuring vessel passing through the neck portion and having one end terminating in proximity to the bottom of the foot portion, at least the foot portion of the pumping means immersed in the liquid contained in the reservoir and wherein the foot portion has a volume substantially greater than that of the neck portion and slightly greater than the refill volume of the measuring vessel, a check valve for opening and closing the foot portion inlet, a supply of compressed gas controllable by the sensing means and applied to effect the opening of the check valve when shut off and to close the check valve and act upon the liquid in the foot portion of the pump to supply same to the measuring vessel when turned on, a three-way valve disposed between the neck portion of the pump and the supply of compressed-air and a start/-stop device connected to the sensing means for controlling three-way valve in response to the signals received from the sensing means.

4,232,803
BULK MATERIAL RETAINING SYSTEM HAVING PLURAL RETAINERS

George H. Muller, Ann Arbor, and William T. Downs, Howell, both of Mich., assignors to A.I.R. Foundation, Ann Arbor, Mich.

Continuation of Ser. No. 758,386, Jan. 10, 1977, abandoned. This application Nov. 6, 1978, Ser. No. 957,773
Int. Cl.[3] B65D *35/28*
U.S. Cl. 222—105 19 Claims

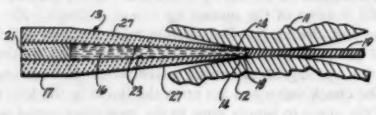


1. A bulk material retaining system comprising a generally rectangular parallelepipedic container including a top and bottom, right and left sides and front and back ends, wherein the back end of the container is an operable closure made generally of left and right doors mounted for pivotal movement about a vertical axis at the back end of the left and right sides respectively, a first retainer positioned vertically between the free end of the left door in a closed position and the right side of the container in spaced relation to the back end of the right side of the container, a second retainer positioned between firstly the left side of the container in spaced relation to the back end of the container and secondly along a continuous line extending upwardly first against the lower portion of the first retainer and then against the left door kept in a closed position, the second retainer being in a position vertically inclined toward the left side of the container and toward the left door kept in a closed position, a flexible liner supported within the container of substantially the same size as the container, said liner includes means for passing bulk material into it and evacuating air therefrom and means for discharging bulk material from the liner, and a manifold secured to the first retainer through which bulk material is discharged from the liner.

4,232,804
MOLTEN METAL FEED TIP

William R. Lewis, Riverside, and Dennis M. Smith, Crestline, both of Calif., assignors to Hunter Engineering Company, Riverside, Calif.

Filed Nov. 2, 1978, Ser. No. 957,186
Int. Cl.[3] B22D *11/06, 11/10*
U.S. Cl. 222—591 10 Claims



1. A molten metal feed tip for a continuous caster comprising:

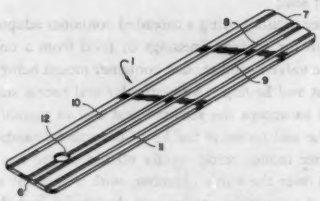
a pair of generally rectangular refractory members each having a downstream edge portion and an upstream edge portion, each of the members being formed of a compressed felt of refractory fibers comprising approximately equal proportions of alumina and silica rigidly bonded with a binder including colloidal silica; and

means adjacent the upstream portion for spacing the pair of members apart for forming a metal feeding gap between the members and admitting molten metal into such gap for flow towards the downstream edge portions.

4,232,805
SEWING FORM

Sally J. Flick, 10905 Westfield Blvd., Indianapolis, Ind. 46280

Filed May 5, 1977, Ser. No. 794,176
Int. Cl.[3] A41H *33/00*
U.S. Cl. 223—37 4 Claims

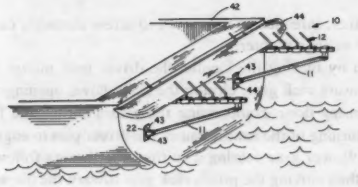


1. A thin, rigid, solid, rectilinear sewing form comprising a rectangular planar bottom surface; an opposing and parallel rectangular planar top surface; a pair of opposing longitudinal sides adapted to serve as folding guides; a pair of opposing ends; and one or more longitudinal grooves in the top surface parallel to the longitudinal edges of the form and running the full length of the form and located, spaced and adapted to serve as cutting guides for hand making cloth trim tape, cloth pockets or folded cloth rope.

4,232,806
WATER SKI RACK

Roland L. Shald, 3137 S. 116th Ave., Omaha, Nebr. 68144

Filed Feb. 22, 1978, Ser. No. 879,982
Int. Cl.[2] B60R *9/12*
U.S. Cl. 224—42.44 5 Claims



1. A water ski rack comprising:

(a) a plurality of spaced apart frame units adapted for connection to a boat comprised of at least one elongated support bar having a first end and a second end and at least one brace bar having a first end and a second end wherein the second end of the support bar is pivotally attached to a support bracket which is slidably adjustable along the length of the brace bar and a first boat mounting bracket is pivotally attached to the first end of the support bar and a second boat mounting bracket is pivotally attached to the first end of the brace bar;

(b) a plurality of upwardly projecting ski holding elements with obliquely and inwardly slanted end projections on their upper portions affixed to the frame units and adapted to support at least one water ski wherein the ski holding elements are slidably adjustable along the frame units;

(c) securing means for selectively securing the ski holding elements along the length of the support bar; and

(d) securing means to selectively secure said support bracket to said support bar, whereby the angle of orientation of the support bar may be varied relative to the boat mounting brackets to maintain the support bar in a substantially horizontal position.

4,232,807

SEALING CARRIER PACK FOR CANS WITH BEADED EDGE

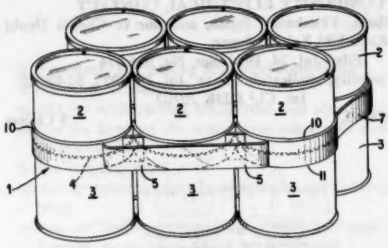
Gerhard Beier, Eisseler Strasse 47, 3090 Verden-Davelsen, and Wolfgang Matthies, Vionvillestrasse 10, 2800 Bremen, both of Fed. Rep. of Germany

Filed Aug. 30, 1978, Ser. No. 938,249

Claims priority, application Fed. Rep. of Germany, Aug. 31, 1977, 2739143

Int. Cl.³ B65D *71/00*

U.S. Cl. 224—45 A **10 Claims**



1. A pack carrier for cans having a substantially round cross-section with a beaded edge or circumferential projection at at least one end, said cans having a recessed openable closure on said end having said beaded edge comprising a flat frame having a carrying handle of extruded plastic, said flat frame being provided with a plurality of attached flat receiving and sealing areas opposing each other in pairs on the frame surface, said receiving and sealing areas having a flat surface of the dimension of the beaded edge of said can, said flat receiving and sealing areas being provided with outer extended elastic lips adapted to completely surround the outer beaded edges of said cans and bear upon them, said extended lips having a flange or bulge over said flat receiving and sealing area adapted to receive said beaded edge where the beaded edge is touched only below, laterally and on the top edge, one of said outer extending elastic lips of one of said flat receiving and sealing areas extending to and merging into the outer extending elastic lip of another of said flat receiving and sealing areas adjacent thereto tangentially, wherein, in one of said outer extended lips which extends to and merges with another of said outer extended lips adjacent thereto tangentially, said flange or bulge does not extend in the area tangential to two of said extended lips where at this tangential point and for a short distance on each side thereof said adjacent extended lips merge to one extended lip without a flange or bulge on either side thereof forming a vertical extension, said vertical extension at said tangential point being reduced in height to below the elevation of the beaded edge of the cans, the thickness of the extended lips at said vertical extension being such that the walls of said cans at the tangential points practically touch and support each other in a tight unit, whereby pairs of cans can be inserted therein and maintained in sealed and sanitary condition.

4,232,808

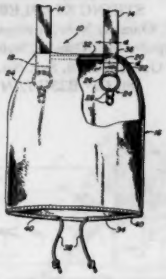
INSTRUMENT PROTECTING AND CARRYING STRUCTURE

Roy M. Gray, P.O. Box 10508, Phoenix, Ariz. 85064

Filed Oct. 9, 1979, Ser. No. 82,889

Int. Cl.³ F16B *39/24*; A45C *11/08*

U.S. Cl. 224—205 **4 Claims**



1. An instrument protecting and carrying structure comprising:

(a) an elongated strap of flexible material and having opposite ends;

(b) a cover bag for containing an instrument, said cover bag of flexible material and disposed in an inverted position with a closed upwardly disposed end and an open downwardly facing end;

(c) said strap having its opposite ends passing through the closed end of said cover bag at spaced apart locations with the opposite ends of said strap located within said cover bag adjacent the closed end thereof;

(d) said cover bag attached to said strap at the points where the opposite ends pass through the closed end of said cover bag; and

(e) coupling means on each of the ends of said strap for connection to the instrument containable in said cover bag.

4,232,809

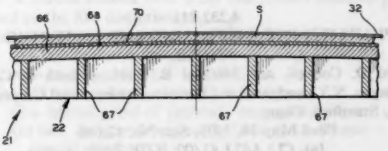
APPARATUS FOR THERMALLY SEVERING GLASS

Hans W. Boehm, Toledo; Richard A. Herrington, Walbridge, and Waldemar W. Oelke, Rossford, all of Ohio, assignors to Libbey-Owens-Ford Company, Toledo, Ohio

Continuation-in-part of Ser. No. 905,687, May 15, 1978, abandoned, which is a division of Ser. No. 767,051, Feb. 9, 1977, Pat. No. 4,113,162. This application Apr. 16, 1979, Ser. No. 30,177

Int. Cl.³ B26F *3/00, 3/12*

U.S. Cl. 225—93.5 **11 Claims**



1. In apparatus for cutting a heavy, thick glass sheet along an intended line of cut, including means for supporting a heavy sheet of glass to be cut and means overlying said glass supporting means for cutting said sheet along an intended line of cut, the improvement which consists in that said glass supporting means comprises a table having a supporting surface against which said sheet of glass rests in position to be cut, said supporting surface having a convex curvature causing said sheet

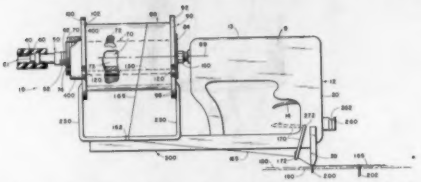
to assume a complementary curvature when resting thereon, said convex supporting surface defining an arc having an axis extending normal to said intended line of cut.

4,232,810

STRING STAPLER

B. Carson Russell, Omaha, Nebr., assignor to Carlson Stapler and Shippers Supply, Inc., Omaha, Nebr.

Filed Oct. 10, 1978, Ser. No. 950,125
Int. Cl.[2] B25C *1/04*
U.S. Cl. 227—19 **5 Claims**



1. A string stapler comprising a stapling gun having a frame provided with a substantially elongated handle extending forwardly and rearwardly, said gun having an air inlet port on its rearward side behind said handle, said frame having a downward opening staple outlet having a substantially elongated shape extending from right to left, said outlet being disposed forwardly of said handle, a staple magazine fixed to said frame, staples in said magazine having recesses extending upwardly thereinto from the lower ends thereof, a trigger mounted on said frame, said gun delivering a staple from said magazine out through said outlet upon operation of said trigger when said air inlet port is connected to a source of pneumatic pressure, a string guide between said outlet and the rearward end of said handle whereby said gun is adapted to be moved rearwardly during operation between shooting of staples, means connecting said string guide to said frame, said string guide having a string cradling concave surface facing upwardly and having its lowermost part behind said staple outlet so that when a taut string extends across said string cradling surface closely under said staple outlet and forwardly from said staple outlet it will be bridged by such a staple shot from said outlet, a string spool disposed rearwardly of said handle, a string spool attaching assembly attaching said string spool rotatably to said frame, a string directing assembly attached to said frame rearwardly of said outlet and guiding said string from said spool forwardly to said string cradle.

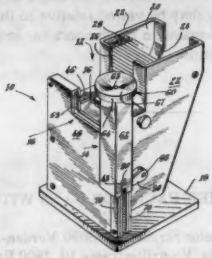
4,232,811

APPARATUS FOR DISPENSING AND INSERTING STICKS

Edward D. Cottrell, and Michael B. Robbins, both of Cattaraugus, N.Y., assignors to Champion International Corporation, Stamford, Conn.

Filed May 24, 1979, Ser. No. 42,003
Int. Cl.[3] A47J *43/00*; B27F *7/02*
U.S. Cl. 227—117 **14 Claims**

1. Apparatus for mounting a product on a stick, including:
reciprocating means for inserting said stick into said product along an axis of insertion;
means for delivering said stick to a feed position wherein the longitudinal axis of a stick thereat forms an angle with respect to said insertion axis; and
rotatable means operatively coupled to said reciprocating inserting means for rotatably shifting said stick from said feed position to said inserting means and into longitudinal



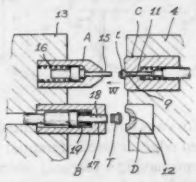
alignment with said insertion axis in response to downward movement of said inserting means.

4,232,812

APPARATUS FOR MAKING A TRI-METALLIC COMPOSITE ELECTRICAL CONTACT

Akira Shibata, Yokohama, Japan, assignor to Chugai Denki Kogyo Kabushiki-Kaisha, Japan

Filed Jul. 24, 1978, Ser. No. 926,874
Claims priority, application Japan, Jul. 25, 1977, 52-88285
Int. Cl.[3] B23K *20/02*
U.S. Cl. 228—3.1 **9 Claims**



1. Apparatus for making a tri-metallic electrical contact by cold pressing, comprising
means for aligning a plurality of cut wires;
a first die and punch set having a first cavity for firmly sustaining therein the confronting end portions of a first pair of said aligned wires while the confronting end portions of a second pair of said aligned wires are disposed exteriorly of said first cavity,
said die and said punch being movable one with respect to the other for causing plastic deformation between said confronting end portions of said second pair of said wires at the exterior of said first cavity, thereby to cold press the last-named end portions together along a first seam,
means for transferring said aligned wires from said first die and punch set to a second die and punch set,
said second die and punch set having a second cavity for firmly sustaining therein said first seam and said end portions of said second pair of aligned wires after transfer of said wires to said second die and punch set, and with said end portions of said first set of wires being disposed exteriorly of said second cavity,
said die and said punch of said second set being movable one with respect to the other for causing plastic deformation in said confronting end portions of said first pair of aligned wires at the exterior of said second cavity thereby to cold press together the confronting end portions of said first pair of wires along a second seam, and
said means for transferring said aligned wires being operative to transfer said first seam and end portions of said

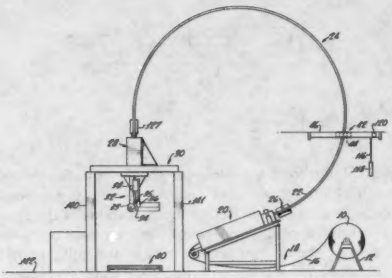
second pair of wires directly to said second cavity while said confronting end portions of said first pair of wires are still in said first cavity.

4,232,813

METHOD AND APPARATUS FOR MAKING BENT PIPE

Homer L. Eaton, Leucadia, Calif., assignor to Eaton-Leonard Corporation, Carlsbad, Calif.

Filed Mar. 10, 1978, Ser. No. 885,329
Int. Cl.[3] B21D 9/00
U.S. Cl. 228—147 67 Claims



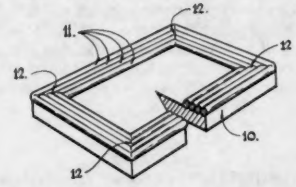
1. Apparatus for making bent pipe comprising
a source of flat stock,
means for withdrawing stock from said source,
means for forming the withdrawn stock into a continuous length of pipe,
a pipe bending head,
means for rotating said pipe bending head to control plane of bend,
means for feeding said continuous length of pipe from said forming means to said pipe bending head,
means for operating said bending head to bend said pipe, and
means for storing a variable length of said pipe in a curved path between said pipe forming means and said pipe feeding means.

4,232,814

METHOD AND APPARATUS FOR FABRICATING A SEALING COVER UNIT FOR A CONTAINER FOR A SEMICONDUCTOR DEVICE

Norman Hascoe, Larchmont, N.Y., assignor to Semi-Alloys, Inc., Mount Vernon, N.Y.

Division of Ser. No. 5,790, Jan. 23, 1979, Pat. No. 4,190,176.
This application Jun. 14, 1979, Ser. No. 48,365
Int. Cl.[3] B23K 9/225
U.S. Cl. 228—173 E 5 Claims



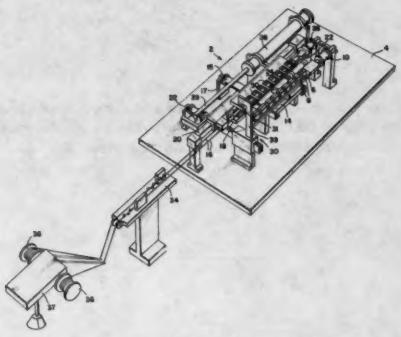
1. The method of fabricating an hermetic sealing cover unit for a container for a semiconductor device and including a metallic cover element comprising:
forming a flat single-layer multiturn wire winding of heat-fusible material in situ on the cover element, the periphery of said winding being substantially in registry with the periphery of the cover element;
and fusing said winding to said cover element at a plurality of space points.

4,232,815

INTEGRATED CIRCUIT LEAD COUPLING DEVICE AND METHOD

Masahiko Nakano, San Diego, and Nobuaki Miyauchi, both of San Diego, Calif., assignors to Kyocera International, Inc., San Diego, Calif.

Filed Nov. 6, 1978, Ser. No. 958,118
Int. Cl.[3] B23K 31/02; H01L 21/60
U.S. Cl. 228—180 A 29 Claims



1. A method for coupling leads to integrated circuit packages comprising the steps of:
(i) providing a lead frame rail member comprising a plurality of resilient leads coupled to a first rail and a plurality of resilient leads coupled to a second rail, said first rail coupled to said second rail such that leads of said first rail are separated from and oppose said leads of said second rail;
(ii) spreading the leads of each said rail away from the opposing leads of the other rail;
(iii) placing an integrated circuit package between said opposing leads at intervals along the length of said lead frame rail member;
(iv) releasing said leads whereby a plurality of said leads resiliently engage each said integrated circuit package; and
(v) affixed said leads to said integrated circuit packages.

4,232,816

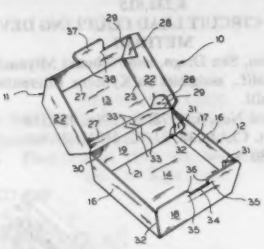
CLAMSHELL TYPE CARTON

Fred J. Johnson, Long Beach, Calif., and Richard L. Bell, Glenmoore, Pa., assignors to Container Corporation of America, Chicago, Ill.

Filed Mar. 16, 1979, Ser. No. 21,256
Int. Cl.[3] B65D 5/26, 05/66
U.S. Cl. 229—33 2 Claims

1. A carton formed from a cut and scored blank of paperboard or the like comprising:
(a) a cover of truncated pyramid configuration and a tray of like configuration hingedly joined along a fold line common to said cover and said tray;
(b) said tray and said cover each having:
(i) a central panel of generally rectangular form;
(ii) side, front and rear walls foldably connected to each central panel;
(iii) at least two of said walls positioned opposite each other having the shape of a trapezoid with the minor base thereof connected to its corresponding central panel;
(c) corresponding walls of said tray and said cover having said trapezoidal shape being provided with flaps foldably connected at inclined fold lines at the ends of said walls;
(d) each of said flaps being secured to an adjacent walls;

(e) the side walls of said cover extending beyond the side walls of said tray so that the cover overlies the tray with the free edges of said side walls of said tray being in



contact with the interior faces of the corresponding side walls of said cover thereby providing a gap for escape of moisture from the interior of the carton.

4,232,817

ADJUSTMENT CONTROL FOR A THERMOSTATIC VALVE

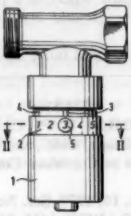
Bernhard W. Braukmann, and Rudolf Vollmer, both of Mosbach, Fed. Rep. of Germany, assignors to Braukmann Armaturen AG, Bahnweg, Switzerland

Filed Aug. 2, 1978, Ser. No. 930,244

Claims priority, application Fed. Rep. of Germany, Jul. 3, 1978, 2737083

Int. Cl.³ F24F *11/06*

U.S. Cl. 236—42 **6 Claims**



1. An adjustment control for a thermostatic radiator valve consisting of a non-rotatable component to said valve, a rotatable knob mounted on said non-rotatable component for setting the temperature control, said knob having a maximum rotation of about one revolution, a releasable spring like stop means operable between said non-rotatable component and said knob, said stop means limiting the rotation of said knob at a predetermined intermediate rotational position, said stop means consisting of a spring like member extending from said non-rotatable component and engageable with a predetermined interior portion of said knob to provide the stop, non releasable stop means between said knob and said component to limit the rotation of said knob after release of said spring like stop means, and a moveable member supported in said knob and extending therethrough, moveable against said spring like member to release the latter from the stop position to permit further rotation of said knob to said non releasable stop means.

4,232,818

CONTROL UNIT FOR STARTING A CLIMITIZATION PROCEDURE IN A BUILDING

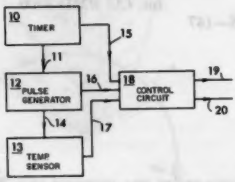
Jorn U. Christiansen, Hvidovre, Denmark, assignor to Tour & Andersson Aktiebolag, Johanneshov, Sweden

Filed Mar. 28, 1979, Ser. No. 24,536

Claims priority, application Sweden, Mar. 28, 1978, 7803490

Int. Cl.³ F23N *5/20*; G05D *23/00*

U.S. Cl. 236—46 R **14 Claims**



1. A control unit for controlling the start of a climatization procedure in a building, wherein a pulse generator is provided for generating pulses used in timing the operations of the control unit, first and second temperature sensor means are provided for sensing the interior temperature of the building and the external temperature outside of the building and for respectively producing first and second voltages in accordance therewith, and an equivalent electrical circuit for controlling the operations of the control unit is arranged to simulate the thermal properties of the building during temperature conditioning operations, i.e., heating or cooling, the equivalent electrical circuit being fed with a said first voltage representative of the interior temperature in the building, and a said second voltage representative of the external temperature outside of the building, and the time required for a discharge, a charge or an equalization of one or more voltages on condensers contained in the equivalent electrical circuit being representative of the period of time required for conditioning the temperature of the building, after the conditioning system has been out of use during a predetermined period of time, the discharge or charge or equalization time being short as compared with the time for conditioning the temperature of the building and being used for calculation of the correct moment for starting the conditioning procedure by the control unit, said pulse generator being arranged to generate pulses of a very high frequency, and said control unit further including a binary type pulse frequency divider for receiving pulses from said pulse generator and for producing a pulse train of binary pulses of a substantially lower frequency, a decadic counter connected to one output of said pulse frequency divider for converting the binary pulses into decadic pulses, said decadic counter including coincidence circuits connected to a plurality of outputs of the decadic counter for producing pulses representative of different end digits of the decadic numbers, and a plurality of different control means for controlling the start of the climatization procedure by said control unit connected to individual ones of said outputs of said decadic counter so that the sequence of operations of said control unit under the control of said equivalent electrical circuit takes place in an order determined by said end digits.

4,232,819

CONTROL SYSTEM FOR ENVIRONMENTAL APPARATUS

Charles Bost, Melbourne, Fla., assignor to Sentry Controls, Inc., Melbourne, Fla.

Filed Jul. 10, 1978, Ser. No. 922,837

Int. Cl.³ E05B *19/26*

U.S. Cl. 236—47 **15 Claims**

1. A switching system for controlling operation of conventional electrical apparatus such as an air conditioner or the like

of the type having a power cord adapted to plug into a supply of electrical current, said switching system comprising:

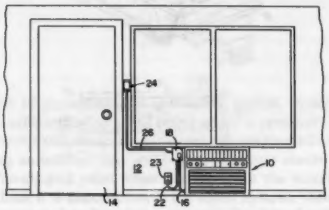
a first housing having first means for receiving said power cord and second means for connecting with said current supply;

a switching circuit in said first housing for making and breaking a circuit connection between said power cord and said current supply through said first and second means;

a second housing;

a magnetic detector with said second housing;

circuit means electrically coupling said magnetic detector with said switching circuit in order to operate said switching circuit to alternately make and break said circuit connection between said power cord and said current supply responsive to detection of a magnetic element adjacent said second houseing, said circuit means including:



(a) means for making said circuit connection responsive to the presence of said magnetic element in said second housing, and breaking said circuit connection responsive to removal of said magnetic means from said second housing;

(b) means for introducing a first time delay period between detection of the removal of said magnetic element in said second housing and breaking of said circuit connection;

(c) means for initiating a second time delay between detection of said magnetic element in said second housing and operation of said switching means;

(d) means for bypassing said second time delay initiating means to energize said switching means following detection of said magnetic element in said second housing; and

a keying mechanism having a magnetic element therewith and dimensioned to permit movement of said magnetic element into and out of said second housing.

4,232,820

HEAT COLLECTOR SYSTEM

Alfred E. Ritter, Mülheim, and Jürgen Kleinwächter, Lörrach, both of Fed. Rep. of Germany, assignors to Max-Planck-Gesellschaft zur Fördenung der Wissenschaften e.V., Göttingen, Fed. Rep. of Germany

Filed Aug. 31, 1977, Ser. No. 829,427

Claims priority, application Fed. Rep. of Germany, May 6, 1977, 2720319

Int. Cl.[2] F24J *3/02*

U.S. Cl. 237—2 B **9 Claims**

1. A heat collector system comprising:

(a) a heat collector having an inlet conduit means, an outlet conduit means, and containing a heat transmitting liquid,

(b) a heat pump having first and second heat exchangers in the form of an evaporator and a condensor and a cooling fluid circuit interconnecting said heat exchangers,

(c) said heat collector being effective to take radiation heat from the environment,

(d) the heat collector having a structural configuration effective to additionally absorb convection heat as a convector which causes a good heat transmission between the ambient air and said heat transmitting fluid,

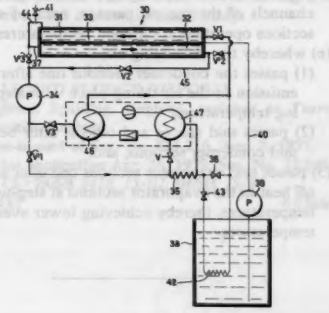
(e) first fluid flow means for connecting the first heat exchanger between said inlet and outlet conduits,

(f) a heat consuming mechanism,

(g) second fluid flow means for connecting the condensor with the heat consuming mechanism,

(h) third fluid flow means for connecting the heat consuming mechanism between said inlet and outlet conduits while bypassing the first and second heat exchangers,

(i) the evaporator being capable of supplying liquid to the



heat collector at a temperature below the temperature of the ambient air,

(j) the collector includes two superimposed chambers including an upper chamber made of transparent material and having a heat conductive surface and a lower chamber having a structural configuration effective to absorb heat radiation, and

(k) valve means being effective to selectively direct the fluid flow only through the lower chamber or first through the upper and then through the lower chamber.

4,232,821

HEATING AND VENTILATION SYSTEM

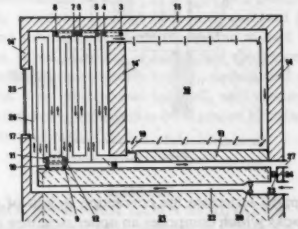
Anders D. Backlund, Holmen, S-820 90 Ytterhogdal, Sweden

Filed May 4, 1978, Ser. No. 902,620

Claims priority, application Sweden, May 6, 1977, 7705311

Int. Cl.[3] G05D *23/00*

U.S. Cl. 237—2 B **3 Claims**



1. A system for heating and ventilating objects and spaces in buildings surrounded by an outer wall, said system comprising:

(a) a heat pumping device having condenser means for heating air to be used for heating said objects and spaces, evaporator means for recovering heat energy from the air discharged from said spaces and objects and means for circulating the air;

(b) first and second air circulating passages, each of the passages comprising a plurality of separate channels in the wall, channels of the respective passages being arranged alternately, at varying distances from the outer surfaces of

the wall, in heat exchanging relationship with one another;

(c) the evaporator means comprising a plurality of series-connected sections, each of the evaporator sections being disposed in heat exchanging relationship with one of the channels of the first passage, each of said evaporator sections operating at different temperatures; and,

(d) the condenser means comprising a plurality of series-connected sections, each of the condenser sections being disposed in heat exchanging relationship with one of the channels of the second passage, each of said condenser sections operating at different temperatures

(e) whereby the circulating air;

(1) passes the condenser sections one after another, heat emission to the air taking place with step-wise increasing temperatures,

(2) passes said spaces and objects after being heated by said condenser sections, and,

(3) passes said evaporator sections one after another, giving off heat to the evaporator sections at step-wise decreasing temperatures, thereby achieving lower average operating temperatures.

4,232,822

METHOD OF AND ARRANGEMENT FOR CORRECTING THE HEIGHT OF RAILWAY UPPER STRUCTURES

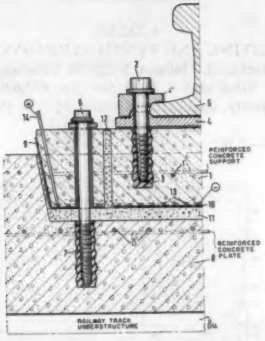
Volker Hahn, Leinfelden, and Werner Fastenau, Esslingen-Rüdern, both of Fed. Rep. of Germany, assignors to Ed. Züblin Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Dec. 27, 1977, Ser. No. 864,605

Claims priority, application Fed. Rep. of Germany, Dec. 28, 1976, 2659161

Int. Cl.[2] E01B *1/00*

U.S. Cl. 238—7 **11 Claims**



5. A support structure for correcting height of unballasted railway tracks which comprises an upper structure including: a reinforced concrete plate, reinforced concrete support means having a bottom side and detachably inserted in said reinforced concrete plate, filling means of hardened material that can be softened again and located between said reinforced concrete plate and said reinforced concrete support means, rail holding means connected to said reinforced concrete support means for detachably holding railway rails in position, fastening means for detachably holding said concrete support means to said reinforced plate, and a heating coil arranged between said reinforced concrete support means and said reinforced concrete plate, said heating coil being provided to soften hardened material of said filling means to facilitate lifting and filling at the bottom side of said reinforced concrete support means.

4,232,823

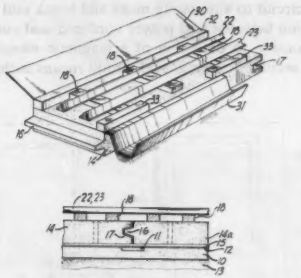
METHOD AND APPARATUS FOR INSTALLATION OF QUENCH CAR TRACK FOR COKE OVEN BATTERIES

Paul P. Eggermann, Milltown, N.J., assignor to Inseco Associates, Inc., East Brunswick, N.J.

Filed May 7, 1979, Ser. No. 36,572

Int. Cl.[3] E01B *1/00*

U.S. Cl. 238—7 **18 Claims**



1. A method for installation of railroad track on a subsoil, comprising the steps of:

compacting the subsoil;

depositing a slag base on the subsoil and subsequently grading the base;

embedding at least two parallel elongated levelling blocks in said base, with said blocks protruding a predetermined distance therefrom and the upper surfaces of said blocks substantially coplanar;

placing a layer of nonpermeable flexible sheet material on said base and levelling blocks;

depositing a layer of aggregate on said sheet material;

placing at least two elongated precast concrete panels on said aggregate layer overlying said levelling blocks, each of said panels having a plurality of vertically oriented holes therethrough;

installing ties and rails on said precast concrete panels; and

injecting a viscous hardenable grout into said aggregate layer through said holes, and allowing said grout to harden.

15. A quench car track installation for a coke oven battery, comprising:

a slag base;

at least two parallel elongated levelling blocks embedded in said base;

a layer of nonpermeable sheet material on said base and levelling blocks;

a layer of aggregate on said sheet material overlying said levelling blocks;

a bonding agent distributed through said aggregate layer for bonding the particles thereof together;

at least two elongated precast concrete panels disposed on said aggregate layer with adjoining portions thereof overlying said levelling blocks;

a plurality of ties restrained against movement in a horizontal plane with respect to the upper surfaces of said panels; and

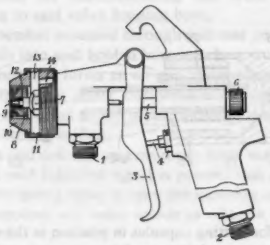
a pair of rails mounted on said ties.

4,232,824

METHOD AND APPARATUS FOR THE PNEUMATIC SPRAYING OF LIQUID PRODUCTS

Michel Binoche, Paris, France, assignor to S K M, Societe Anonyme, Staines, France

Filed Mar. 14, 1978, Ser. No. 886,360
Claims priority, application France, Mar. 22, 1977, 77 08469
Int. Cl.[3] B05B 7/08
U.S. Cl. 239—8 4 Claims



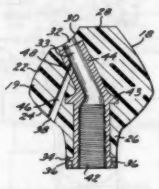
1. Method of pneumatically atomizing liquids, comprising the steps of utilizing a flat jet of paint under a pressure of 1 to 5 bars, in combination with two systems of compressed air, one system being an indirect one and comprising two sheets parallel to the fan-shaped paint sheet issuing from the nozzle and between which it is encompassed, the other system, consisting of two symmetric jets in relation to said flat jet of paint, inclined in the direction of spraying of this jet and directed directly against said paint jet encompassed by two sheets of compressed air, having a power sufficient to pass through said sheets of compressed air, penetrate into said paint jet, and atomize said paint jet, and cooperating with said first compressed air system to constitute the final jet forming a mixture of air and atomized paint encompassed between two parallel sheets of compressed air.

4,232,825

SAFETY FOUNTAIN HEAD

Richard L. Berry, Jr., 178 Roycroft Ave., Long Beach, Calif. 90803

Filed Mar. 29, 1979, Ser. No. 24,886
Int. Cl.[3] E03B 9/20
U.S. Cl. 239—28 1 Claim



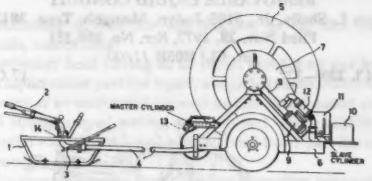
1. A fountain head for a drinking fountain which comprises:
a solid form body molded of a resilient, impact-absorbing plastic having a bulbous shape with a reduced diameter neck, and having a concave groove along the upper edge of a sidewall;
a vertical tubular, open-ended metal sleeve coaxially received in said neck, extending into and terminating within said body, said sleeve having an axially inclined leg portion in alignment with said groove;
conduit attachment means distally carried on the lower end of said sleeve;
a downwardly-facing drain and aeration port in the leg portion of said metal sleeve;
a discharge port coaxial with the groove of said sidewall of said body in open communication with the upper end of said metal sleeve and spaced above the upper end of said sleeve;
a drain and aeration passageway extending downwardly and sidewardly through said body, the upper end of said passageway facing said drain and aeration port of said metal sleeve, and said passageway being flared outwardly and downwardly to prevent material from obstructing said passageway; and
the intermediate portion of said metal sleeve having a rib received within and molded into said body.

4,232,826

LIQUID SLUDGE DISPOSAL

Michael Broughton, Spalding, England, assignor to Farrow Irrigation Limited, England

Continuation-in-part of Ser. No. 821,216, Aug. 2, 1977, abandoned. This application Apr. 24, 1979, Ser. No. 32,919
Int. Cl.[3] B05B 3/18, 15/02; B65H 75/34
U.S. Cl. 239—112 4 Claims



1. Apparatus for liquid sludge disposal, comprising
a land sledge having mounted thereon a sludge spray gun;
a mobile winching hose reel having a power coupling for connection to a tractor power take-off to provide winching power, and arranged for connection to a pumped supply of liquid sludge;
a flexible drag hose connecting said sledge and said gun to a said winching hose reel for feeding said pumped supply of sludge to said gun;
a compressor coupled to an air reservoir and arranged to fill the reservoir with compressed air automatically when the apparatus is in use;
a release mechanism arranged to release said compressed air from the reservoir through said hose and said gun, thus emptying substantially all of the sludge in said hose and said gun, when pumping of said liquid sludge ceases; and
an automatic stop mechanism for decoupling said winching hose reel from said power take-off, said automatic stop mechanism being arranged to be actuated by return of said sledge to said reel.

4,232,827

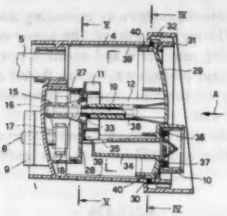
ROCKING-ARM LAWN SPRINKLER

Gian F. Roman, Pasiano, Italy, assignor to Claber S.p.A., Fiume Veneto, Italy

Filed Dec. 22, 1978, Ser. No. 972,232
Claims priority, application Italy, Oct. 3, 1978, 22941/78[U]
Int. Cl.[3] B05B 3/16
U.S. Cl. 239—242 4 Claims

1. Rocking-arm lawn sprinkler for lawns, fields, gardens and cultivated land in general, of the kind comprising a tubular rocking arm with radial perforations therethrough and with a closed end and the opposite end fed with irrigation water and substained for rotation by a box containing a motion-producing system actuated by said irrigation water, characterized in that said box has a rear lid which has a circular periphery fitted into a circular aperture in said box, and an exteriorly threaded

retaining ring threaded into mating threads on the periphery of said aperture whereby upon removal of said retaining ring said



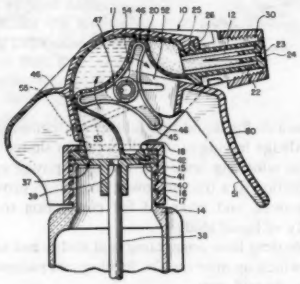
lid can be slipped out of said aperture for giving access to said motion producing system.

4,232,828

HAND HELD LIQUID SPRAY HEAD WITH REMOVABLE LIQUID CONDUIT

Newton L. Shelly, Jr., 3105 Joslyn, Memphis, Tenn. 38128

Filed Nov. 28, 1977, Ser. No. 855,351
Int. Cl.³ B05B *11/00*
U.S. Cl. 239—329 **17 Claims**



1. A liquid spray head comprising, in combination:

a housing including an interior chamber, an inlet portion in communication with said chamber, an outlet portion in communication with said chamber, and an aperture extending between said chamber and the exterior of the housing;

flow defining insert means disposed within said chamber and insertable therein through said aperture, said insert means including an inlet portion extending into said inlet portion of said housing and providing liquid receiving means therein, an outlet portion extending into said outlet portion of said housing and providing liquid spray means therein, and a compressible center portion for establishing liquid communication between said inlet and outlet portions;

a rotor removably mounted for rotation within said chamber and including a plurality of working surfaces disposed to bear against said center portion of said insert means so as to progressively occlude said center portion between said inlet and outlet portions of said insert upon rotation of said rotor whereby liquid therein is forced from said inlet to said outlet portions thereof;

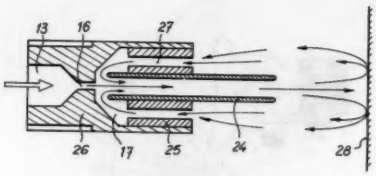
user-actuable trigger means pivotably mounted to said housing and extending through said aperture into operative engagement with said rotor for rotating said rotor to force fluid through the spray head, said rotor and trigger means being removable from said housing through said aperture to facilitate insertion and removal of said flow defining insert means.

4,232,829

NOZZLE ARRANGEMENT FOR ENCAPSULATING MACHINES

Roland F. Gruber, 1, Brusselstraat, B-1744 Sint-Ulriks Kapelle, Belgium

Filed Sep. 20, 1978, Ser. No. 944,002
Claims priority, application Belgium, Sep. 21, 1977, 858900; Nov. 28, 1977, 861262
Int. Cl.³ B05B *1/00*
U.S. Cl. 239—433 **4 Claims**



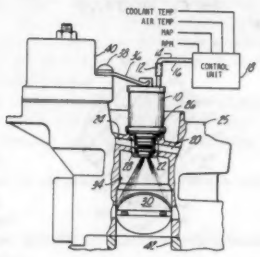
1. A device for putting capsules in position in the encapsulation head of an encapsulating machine comprising at least one expansion chamber, inlet means for feeding air under pressure to said expansion chamber and tubular air outlet means, said device being provided with further air inlet means connected to the atmosphere, said further air inlet means being effected and arranged so that a zone of air at overpressure is created at the outlet from the tubular air outlet means, a slight depression is obtained in the expansion chamber owing to the suction produced by the air introduced into said tubular air outlet means and that a continuous circulation of air takes place round the device.

4,232,830

ELECTROMAGNETIC FUEL INJECTOR

Gary L. Casey, Troy; Albert Blatter, Southfield; John A. Miller, Auburn Heights, and William B. Claxton, West Bloomfield, all of Mich., assignors to The Bendix Corporation, Southfield, Mich.

Filed Nov. 1, 1978, Ser. No. 956,692
Int. Cl.³ B05B *1/32*
U.S. Cl. 239—585 **16 Claims**



1. An electromagnetic fuel injector valve comprising:

a tubular injector body forming an inner chamber between its ends with a centrally bored front end cap fixed to one end and a centrally bored rear end cap fixed to the other;

a bobbin, wound with a coil, disposed in said inner chamber between said end caps and having a longitudinal bobbin bore substantially aligned with the central bore of each end cap;

means for electrically connecting said coil to a source of an injection signal;

a valve assembly including a valve housing and needle valve, said needle valve reciprocally mounted within a

centrally located valve housing bore which terminates in a metering orifice, said needle valve operable to open and close the metering orifice, said front end cap bore being singly stepped to form a shoulder that separates said front end cap bore into a mounting bore and an armature guide bore, said valve housing positioned in the mounting bore to where it abuts said shoulder and said valve needle extending into the armature bore where it is attached to an armature movable in said armature guide bore;

first means for communicating fuel from a pressurized source to said valve housing bore;

a core member mounted through said rear end cap bore that extends into said bobbin bore to where it is adjacent said armature and forms an air gap therebetween; and

a closure spring under compression disposed such that a force is applied to the needle valve to cause a closing of the metering orifice;

wherein said coil sets up a magnetic force across said air gap when said injection signal is present that overcomes the closure spring force to open the metering orifice by lifting the armature and valve needle to where it abuts said core member.

4,232,831

DEVICE FOR SPREADING MATERIAL

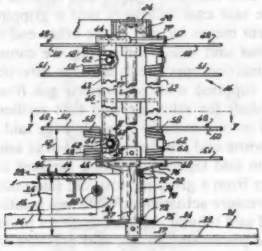
Cornelis van der Lely, 7, Brüschenrain, Zug, Switzerland

Filed Oct. 4, 1977, Ser. No. 839,311

Claims priority, application Netherlands, Oct. 4, 1976, 7610949

Int. Cl.³ A01C *17/00, 19/00*

U.S. Cl. 239—673 **10 Claims**



1. A spreader comprising a hopper for containing material to be spread and having a delivery outlet and at least one rotary distribution member arranged adjacent said delivery outlet and adapted to rotate about a substantially vertical axis at least in part in said outlet, said distribution member comprising a carrier and resilient working members mounted thereon, and carrier extending in at least generally the same direction as the axis of rotation of said distribution member and being spaced from said axis, a plurality of said working members being provided, and working members being disposed in pairs and each said pair being formed from a single curved length of spring steel rod, a helical-wound spring portion of each said rod being formed between the two integral working members of said pair of working members, said helically-wound spring portion being spaced from said carrier.

4,232,832

ATOMIZER DEVICE

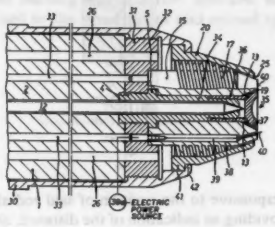
Joseph De Fusco, St. Gall, Switzerland, assignor to Gema AG, Switzerland

Filed Dec. 26, 1978, Ser. No. 973,112

Claims priority, application Switzerland, Dec. 23, 1977, 15997/77

Int. Cl.³ B05B *5/00, 7/12*

U.S. Cl. 239—707 **10 Claims**



1. Atomizer device, for wet lacquer, or the like coating materials, comprising:

an atomizer head having an air outlet part for air and having a liquid outlet part for liquid; a liquid conduit which terminates at an outlet end located in said liquid outlet part;

said atomizer head having an inner part which adjoins said outlet end of said liquid conduit; said inner part having an outside;

ducts communicating from said liquid conduit outwardly to said inner part outside, whereby said liquid conduit outlet end communicates with said inner part outside;

a hollow intermediate part surrounding said outlet end of said liquid conduit and said inner part; said air outlet part being radially outside said intermediate part; said inner part having an outlet end extending generally in the direction of exit of air through said air outlet part and liquid through said liquid outlet part; said inner part outside widening toward said outlet end of said inner part; between said intermediate part and said widened portion of said inner part outside, an outlet slot for liquid is defined;

at least one electrode passing through said intermediate part and projecting out of said intermediate part and beyond said liquid conduit outlet end and also projecting from said intermediate part between said liquid conduit outlet end and said air outlet part.

4,232,833

CONE CRUSHER SETTING INDICATOR

Karl Werginz, Dunwoody, Ga., assignor to Litton Systems, Inc., Columbia, S.C.

Division of Ser. No. 880,060, Feb. 22, 1978, Pat. No. 4,168,036. This application Mar. 19, 1979, Ser. No. 22,223

Int. Cl.³ B02C *2/04*

U.S. Cl. 241—37 **3 Claims**

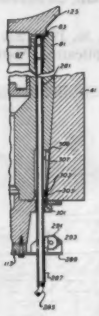
1. A crusher setting indicator for a cone crusher, which crusher includes a movable mantle and a stationary concave, comprising:

a rod, supported by said crusher, arranged for linear movement along a line, the position of said rod along said line of linear movement being directly related to the position of said mantle along said line;

said crusher further including a center hub having an axially extending path formed therein, said rod being positioned within said path wherein said path is a crusher lubrication path and said rod is tubular, said rod thereby being adapted to form a portion of said lubrication path;

said crusher further including a cone support bearing seat arranged for movement along said line wherein one end of said rod is in abutting relationship with said seat;

biasing means coupled to said rod for biasing said rod into said abutting relationship with said seat; and



means responsive to the position of said rod along said line for providing an indication of the distance, along said line, between said mantle and said concave.

4,232,834

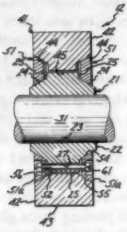
ROLL CRUSHER

Duane W. Player, Salt Lake City, Utah, and James A. Weil, Plymouth, Minn., assignors to Minneapolis Electric Steel Castings Company, Minneapolis, Minn.

Filed Aug. 13, 1979, Ser. No. 65,836

Int. Cl.³ B02C *4/30*

U.S. Cl. 241—293 **18 Claims**



1. A roll crusher comprising:

(a) a hub constructed for mounting on a drive shaft, the hub being of annular configuration and defining axial end faces and an outer circumferential support surface;

(b) a replaceable roll member of annular configuration sized for mounting on the hub in concentric relation therewith, the roll member defining axial end faces, an outer circumferential roll crushing surface and an inner circumferential mounting surface;

(c) the support surface of the hub defining first and second angular shoulders that incline radially inward to the respective axial end faces of the hub;

(d) the mounting surface of the roll member defining first and second angular surfaces that incline radially outward to the respective axial end faces of the roll member;

(e) the first and second angular shoulders respectively disposed in opposed relation to the first and second angular surfaces to define first and second annular recesses having converging sides and each facing axially outward;

(f) means associated with the support and mounting surfaces for preventing relative rotation between the hub and roll member in assembled relation;

(g) a clamping ring for each of said annular recesses, each clamping ring having opposed inner and outer circumferential surfaces that are angled to matably cooperate with the converging sides of the associated recess;

(h) and connecting means for axially urging each clamping ring into the recess to wedge the roll member radially outward relative to the hub.

4,232,835

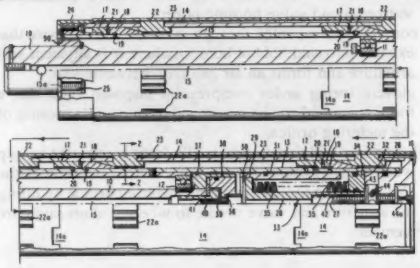
BOBBIN CHUCK

Joshua Benin, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 12, 1979, Ser. No. 56,948

Int. Cl.³ B65H *54/54*

U.S. Cl. 242—46.4 **2 Claims**



1. a bobbin chuck for mounting replaceable bobbins on the external surface thereof comprising: a shaft having a central bore; a tubular member mounted for rotation on said shaft and concentric therewith; a sleeve having a plurality of openings disposed in a concentric relationship about said tubular member, said sleeve being movable axially with respect to said tubular member and rotatable therewith; a plurality of camming members fixed to said tubular member and supporting said sleeve in said concentric relationship, said camming members having tapered camming surfaces; a plurality of radially and axially movable cam followers having mating surfaces engageable with the camming surfaces and extending through the openings in the sleeve for gripping bobbins on said chuck; a first resilient means located at one end of said chuck and seated against said tubular member and said sleeve for urging said sleeve axially in one direction to urge the camming surfaces of said cam follower against said tapered camming surface to move said cam followers into a gripping position; a second resilient means located at the other end of the tubular member against said sleeve for urging the camming member axially in a direction opposite to said one direction; and pneumatic means supplied with pressurized gas from the central bore of the shaft for releasing said first resilient means and allowing said second resilient means to urge said sleeve in said direction opposite said one direction and urge said cam followers away from said tapered camming surfaces to release said cam followers from a gripping position; said pneumatic means including a pressure actuated movable seal positioned between said shaft and said tubular member to direct pressurized gas to and from said pneumatic means, said pressure actuated movable seal comprising a floating piston with an orifice therethrough located between the bore in said shaft and the tubular member and movable toward and away from said pneumatic means and a tube carried by said floating piston to engage said pneumatic means.

4,232,836

RE-TIGHTENER WITH PYROTECHNIC PROPELLANT CHARGE FOR SAFETY-BELT AUTOMATIC WIND-UP DEVICES

Artur Föhl, Schorndorf, Fed. Rep. of Germany, assignor to REPA Feinstanzwerk GmbH, Alfdorf, Fed. Rep. of Germany

Filed Apr. 2, 1979, Ser. No. 26,078

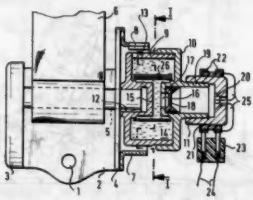
Claims priority, application Fed. Rep. of Germany, Apr. 4, 1978, 2814550

Int. Cl.³ A67B *35/00*; B65H *75/48*

U.S. Cl. 242—107 **9 Claims**

1. In a retightener for safety-belt automatic wind-up devices

having a winding shaft mounted in a bearing block, a safety belt wound around the shaft, a retightening element connected to the shaft, with a pyrotechnic propellant charge which when activated by firing the charge generates an explosive pressure on the retightening element to tighten the safety belt around the body of a motor vehicle passenger to be protected and a liquid medium disposed intermediate the retightener and the pyrotechnic propellant charge, the improvement comprising a receptacle having a circumferential surface containing the



liquid medium coupled to the winding shaft and rotated with the winding shaft, and at least one jet nozzle disposed in the circumferental surface of the receptacle directed substantially tangentially to the axis of rotation of the winding shaft and against a stationary guide ring with guide vanes surrounding the receptacle wherein the guide ring together with the receptacle form a turbine system and wherein the liquid issuing from the jet nozzles when the propellant charge is fired, hits the guide vanes and thereby imparts a strong rotary impulse to the rotatable receptacle.

4,232,837

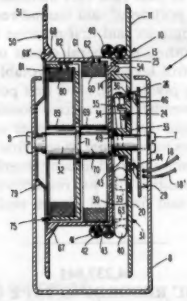
RETRACTABLE CORD REEL

Morris Cutler, Wyndmoor, and Bernard J. Tamarin, Philadelphia, both of Pa., assignors to The Vacuum Cleaner Corporation of America, Philadelphia, Pa.

Continuation of Ser. No. 835,771, Sep. 22, 1977, abandoned, which is a continuation of Ser. No. 640,540, Dec. 15, 1975, abandoned, which is a division of Ser. No. 473,885, May 28, 1974, Pat. No. 3,929,210. This application May 2, 1979, Ser. No. 35,259

Int. Cl.[2] B65H *75/48*

U.S. Cl. 242—107 **11 Claims**



1. A retractable cord reel assembly comprising:

(a) a main hub having a first axial aperture,

(b) an auxiliary hub concentric with and disposed within said main hub and having a second, non-circular axial aperture coaxial with said first axial aperture,

(c) a first spring coiled within said main hub with its inner end fastened to said main hub,

(d) a second spring coiled within said auxiliary hub with its outer end fastened to said auxiliary hub,

(e) a bushing having a generally cylindrical intermediate portion to which the inner end of said first spring is fastened, an inner, substantially planar end portion whose outline is congruous with the outline of said second non-circular axial aperture, and an outer end portion whose outline is substantially congruous with said first aperture, said inner end portion being disposed in said second aperture whereby said bushing rotates in unison with respect to said auxiliary hub, said outer end portion being disposed for rotary movement within said first aperture, and

(f) an arbor which passes through said second aperture, the bore of said bushing and said first aperture, said arbor being fastened to the inner end of said second spring.

4,232,838

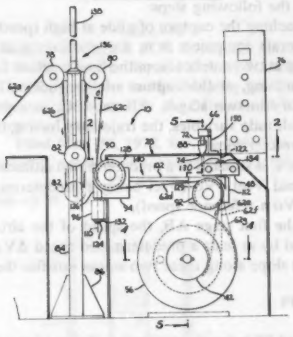
POSITIVE SELF-ORIENTING TRAVERSE APPARATUS IN WIRE TAKE-UP MACHINE

Ben Bravin, Los Angeles, Calif., assignor to Dynamex Corporation, Long Beach, Calif.

Filed Mar. 19, 1979, Ser. No. 21,787

Int. Cl.[3] B65H *54/30*

U.S. Cl. 242—158 R **15 Claims**



1. In an apparatus for winding wire and the like in uniform layers onto a reel, the combination comprising:

a first wire guide means for defining a first wire path and guiding wire along said first path;

a first pivot means for pivotally mounting said first wire guide means about a first axis, said first axis of said first pivot means being substantially tangential to said first wire path defined by said first wire guide means;

a second wire guide means for defining a second wire path and guiding wire along said second path;

a second pivot means for pivotally mounting said second wire guide means about a second axis;

orientation means coupled to said first and to said second wire guide means, said orientation means being a means for maintaining said first and second wire paths substantially co-planar; and

drive means for reciprocally driving said second wire guide means along a predetermined path,

whereby said wire from a wire source is guided from said source to said first wire guide means, from said first wire guide means to said reciprocating second wire guide means and then from said second wire means onto said reel.

4,232,839

METHOD AND SYSTEM FOR CONTROLLING THE DECELERATED APPROACH OF AN AERODYNE

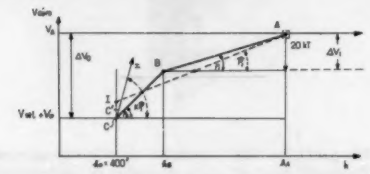
Jean-Luc Sicre, Meudon la Foret, and Daniel Gruaz, Le Chesnay, both of France, assignors to Societe Francaise d'Equipements pour la Navigation Aerienne (S.F.E.N.A.), Velizy-Villacoublay, France

Filed Nov. 10, 1977, Ser. No. 850,134

Claims priority, application France, Nov. 12, 1976, 76 342181; Oct. 12, 1977, 77 30703

Int. Cl.³ G05D 1/00, 1/12

U.S. Cl. 244—188 6 Claims



1. A method of controlling the decelerated approach of an aircraft on glide radioalignment, said aircraft having equipment comprising at least one landing gear which can take the positions gear retracted and gear down, at least one control surface such as a flap which can take at least three positions, flap in final position for landing, flap at one notch from the final position for landing, and flap at two notches from the final position for landing, and a throttle having a slow position, comprising the following steps:

(a) approaching the capture of glide at high speed, at which the aircraft equipment is in the positions gear retracted and flap at two notches from the final position for landing;

(b) determining, at the capture of the glide, a theoretical trajectory in two stages, AB and BC, in a program of speed/altitude variables, the trajectory having the following characteristics,

(i) point C is situated at a predetermined altitude ho and at a speed Vsel+Vo (Vsel being a predetermined speed and Vo a reference speed),

(ii) in the first stage AB, the speed of the aircraft is reduced by at least a predetermined speed ΔV_1, and

(iii) the slope along these two stages satisfies the equation

$$P2 = kP1$$

P1 and P2 being the respective slopes of stages AB and BC, with k being an experimentally determined value;

(c) determining an altitude hA which the aircraft is to reach in the first stage;

(d) decelerating the aircraft in a first phase including at the start thereof engaging the landing gear in the gear down position and engaging the flap at one notch from the final position for landing;

(e) determining the actual trajectory of the aircraft and comparing the actual trajectory with the theoretical trajectory;

(f) correcting the power by manipulating the throttle if the total deceleration is too great after a decrease of speed ΔV compared to point A;

(g) determining the altitude h_B where the second stage should begin;

(h) decelerating the aircraft in a second phase at the beginning of which the flap is engaged in final position for landing and the throttle is placed in the slow position;

(i) correcting the power by manipulating the throttle; and

(j) capturing and maintaining Vref, whereby the speed of the aircraft should be less than the speed Vsel+Vo and/or the altitude of the aircraft is reduced below a predetermined altitude.

4,232,840

TAPE CASSETTE

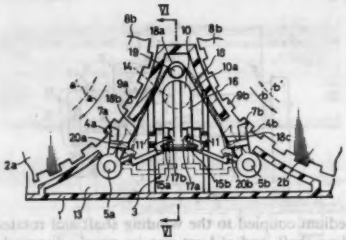
Kokichi Sugawara, Miyagi, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Apr. 30, 1979, Ser. No. 34,762

Claims priority, application Japan, May 8, 1978, 53-61346[U]

Int. Cl.³ G11B 23/10

U.S. Cl. 242—198 8 Claims



1. A tape cassette for use in a magnetic recording and reproducing apparatus comprising a housing including a bottom wall, first and second tape reel members rotatably mounted in said housing, said first and second reel members being mounted in said housing a predetermined distance apart defining an access space therebetween, each said reel member including a flanged portion having a toothed peripheral extent, a first reel locking member pivotally mounted on said bottom wall within said access space adjacent the toothed peripheral extent of said first reel member, a second reel locking member pivotally mounted on said bottom wall within said access space adjacent the toothed peripheral extent of said second reel member, each said reel locking member being pivotable from a first position wherein an end portion thereof is adapted to lockingly engage the toothed peripheral extent of a respective reel member to a second position wherein said end portion is disengaged from the toothed peripheral extent of a respective reel member, a signal wound torsion spring disposed within said access space and interconnecting said first and second reel locking members, said spring having a first leg connected with a portion of said first reel locking member to normally urge the latter into its said first position in locking engagement with the toothed peripheral extent of said first reel member and a second leg connected with a portion of said second reel locking member to urge the latter into its said first position in locking engagement with the toothed peripheral extent of said second reel member, and control lever means pivotably mounted in said housing and being pivotable from a first position spaced from said reel locking members to a second position in contact with a portion of each said reel locking member whereby, when said control lever means moves from its said first position to its said second position, each said reel locking member moves from its respective first position to its respective second position thereby releasing said first and second reel members so they are free to rotate.

4,232,841

MAGNETIC RECORDING TAPE CASSETTE

Noritsugu Hashimoto, Takaoka, Japan, assignor to Hitachi Maxell, Ltd., Osaka, Japan

Filed Oct. 13, 1978, Ser. No. 951,147

Claims priority, application Japan, Oct. 14, 1977, 52-138154[U]

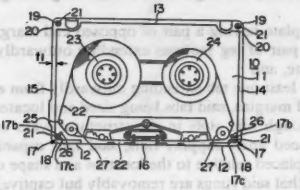
Int. Cl.³ G11B 23/10

U.S. Cl. 242—199 6 Claims

1. A magnetic recording tape cassette comprising top and bottom cases, each of the cases having a front wall with a plurality of openings, a rear wall and side walls; a plurality of bosses formed adjacent to the respective corners of the cases, said cases being assembled together by means of screw passing

through holes disposed in the respective bosses, said assembled cases defining a chamber therebetween for receoving a magnetic recording tape,

each of said bosses situated adjacent to the front wall of the bottom case being composed of a base part having an arcuate wall extending between the inside faces of the front wall and one of the side walls and a circular connecting column projected from the top face of the base part so



as to be engaged within the hole defined in the corresponding boss situated in the top case, a part of the peripheral face of the connecting column being formed so as to be aligned with the arcuate wall, and

at least one rib with a predetermined thickness formed integral with each of the bosses situated adjacent to the front wall of the bottom case so as to project radially from the corresponding arcuate wall.

4,232,842

FISHING REEL HAVING SUPPORT FOR A DEFLECTED SPOOL SHAFT

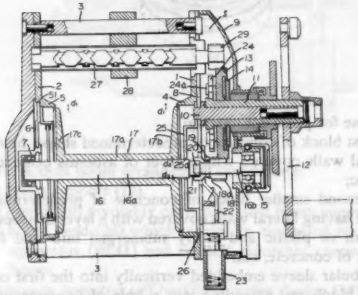
Hideo Noda, Sakai, Japan, assignor to Shimano Industrial Company, Limited, Osaka, Japan

Filed Mar. 9, 1979, Ser. No. 19,144

Claims priority, application Japan, Mar. 14, 1978, 53-33064[U]

Int. Cl.³ A01K *89/015*

U.S. Cl. 242—212 **5 Claims**



1. A fishing reel comprising:

(a) a pair of opposed side plates, each of said side plates having an annular frame extending axially inwardly and being connected by a plurality of connecting rods to the other side plate at regular intervals, a second side plate of said pair having a first bearing;

(b) a gear cover fixed at the outside of a first side plate of said pair, said gear cover and first side plate having a space therebetween, said gear cover having a second bearing;

(c) a handle shaft rotatably supported between said first side plate and said gear cover, said handle shaft projecting outwardly of said gear cover and carrying a handle bar at the projecting end of said handle shaft;

(d) a master gear supported to said handle shaft, said master gear being arranged within said space;

(e) a spool shaft journaled between said first bearing and said second bearing, said spool shaft having a larger diameter shaft portion and a smaller diameter shaft portion, said larger shaft portion being journaled to said first bearing, said smaller diameter shaft portion being journaled to said second bearing and having a first engaging portion;

(f) a spool fixed to said larger diameter shaft portion of said spool shaft, said spool comprising a trunk and a pair of flanges which extend from both axial ends of said trunk radially outwardly thereof, said flanges having slightly smaller outer diameters than the inner diameters of said annular frames, the outer periphery of said flanges opposing the inner peripheries of said annular frames;

(g) a pinion supported to said smaller diameter shaft portion of said spool shaft to be axially slidable therealong said pinion being arranged within said space, meshed with said master gear, and provided at one axial end with a second engaging portion engageable with said first engaging portion of said spool shaft;

(h) control means for controlling the sliding motion of said pinion; and,

(i) support means provided at said first side plate and having a support portion supporting said spool shaft at a substantially intermediate portion thereof, said support portion of said support means being adapted to be normally free from said spool shaft but to support said spool shaft by contact therewith when said spool shaft deflects a predetermined amount.

4,232,843

MOLDED NOZZLE FOR ROCKET MOTOR

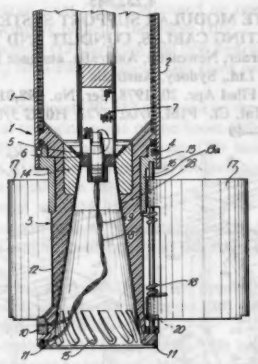
Michael N. Clark, Loretteville, and Donald L. Smith, St. Foy, both of Canada, assignors to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Ontario, Canada

Filed Mar. 30, 1978, Ser. No. 891,924

Claims priority, application Canada, May 25, 1977, 279107

Int. Cl.² F42B *13/32*

U.S. Cl. 244—3.29 **10 Claims**



1. A rocket nozzle assembly comprising:

(a) an ablative fibre-reinforced thermosetting plastic nozzle body having a throat and an exit for positioning in a rocket motor chamber;

(b) an elongated metallic retaining ring integrally molded in an circumscribing said body adjacent said throat for positioning said nozzle body in said rocket motor chamber and to spread out aerodynamic and thermal expansion loads over the nozzle body and transmit these loads to the rocket motor chamber;

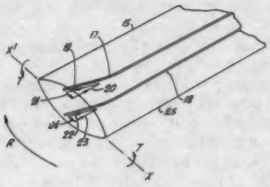
(c) a metallic fin supporting ring integrally molded in and circumscribing said body adjacent said exit; and
(d) a metallic electrical contact ring integrally molded in and circumscribing said exit electrically insulated from the rocket and adapted to be electrically connected to a firing circuit.

4,232,844

AEROFOIL WITH COMPOSITE TIP SECTION HAVING SKEWED FIBRES

Arnold J. Sobey, Hindhead, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Jan. 2, 1979, Ser. No. 445
Claims priority, application United Kingdom, Jan. 3, 1978, 00097/78
Int. Cl.³ B64C *3/20*
U.S. Cl. 244—123 **3 Claims**



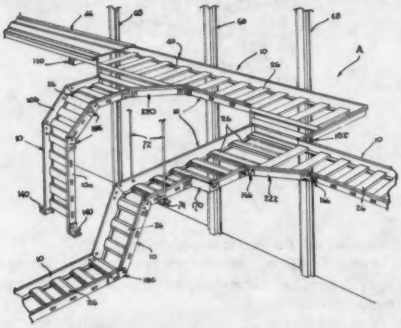
1. An aerofoil having a direction of principal bending stiffness extending substantially spanwise, said aerofoil comprising a tip section formed at least in part of composite structure in which a plurality of fibres extend generally parallel to a spanwise axis of said areofoil and wherein a substantial number of said fibres terminate at said tip section in positions skewed to the spanwise direction such that the direction of principal bending stiffness is diverted away from the spanwise direction in said tip section towards an edge of the aerofoil.

4,232,845

ON-SITE MODULAR SUPPORT SYSTEMS FOR SUPPORTING CABLES, CONDUIT AND THE LIKE

Raymond Turner, Newcastle, Australia, assignor to Aquila Steel Company, Ltd., Sydney, Australia

Filed Apr. 20, 1978, Ser. No. 898,019
Int. Cl.³ F16L *3/00, 3/22*; H02G *3/04*
U.S. Cl. 248—49 **15 Claims**



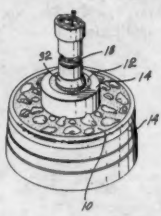
1. A modular support system capable of being assembled at an on-site location, said modular support system comprising:
(a) a plurality of support rails, each of said support rails being comprised of;
(1) a structural wall,
(2) means associated with said structural wall for connection of said structural wall to a generally stationary structural member,
(3) means forming a plurality of spaced apart slots in the structural wall of said rail, and
(4) a support flange angularly struck from said structural wall,
(b) a plurality of rungs, each of said rungs being comprised of;
(1) a plate having a pair of opposed end margins,
(2) a pair of leg sections extending outwardly from said plate, and
(3) at least one tab extending outwardly from each of said end margins, said tabs being sized and located to extend through said slots in the structural walls of a pair of spaced apart support rails, said tabs capable of being displaced relative to the location and shape of said slots so that said rungs are removably but captively attached to said support rails, and where said support flanges of a pair of spaced apart rails face eech other when said rungs are attached to said pair of spaced apart rails, and said flanges being located so that said leg sections of said rungs are engagable with said support flanges when said rungs are attached to said pair of spaced apart rails.

4,232,846

BASE FOR POLES

Raymond Bressani, 137 Deschenes St., Rawdon, (Domaine Langlois), Canada (J0K 1S0)

Filed Feb. 26, 1979, Ser. No. 14,997
Int. Cl.² F16M *13/00*
U.S. Cl. 248—158 **5 Claims**



1. A base for poles comprising:
(a) a first block of concrete of predetermined shape, having lateral walls covered with a layer of asbestos cement or plastic;
(b) a second smaller block of concrete of predetermined shape having lateral walls covered with a layer of asbestos cement or plastic and partly submerged into said first block of concrete; and
(c) a tubular sleeve embedded vertically into the first concrete block and extending into a hole of predetermined diameter in the second block, said second block and the portion of the tubular sleeve located within said second block, serving as a socket for receiving a pole and wherein the hole in said second block is of the same diameter as the outer diameter of a pole having the same inner diameter as the outer diameter of said tubular sleeve, so as to fit tightly over said tubular sleeve.

4,232,847

CONCRETE SCREED OR FORM SUPPORT

Carl W. Cooper, 368 Fifth Ave., San Diego, Calif. 92103

Filed Jul. 11, 1977, Ser. No. 814,227
Int. Cl.³ F16M *13/00*
U.S. Cl. 248—218.4 **1 Claim**

1. A concrete screed or form support comprising: a formed

and tempered rod of metal, for attachment to a stake; said rod having a generally upright three-point clamp portion shaped for partial encircling positioning on a stake with portions disposed about the axis of the clamp portion to exert a non-slip grip upon such stake; said rod having an off-set lower terminal

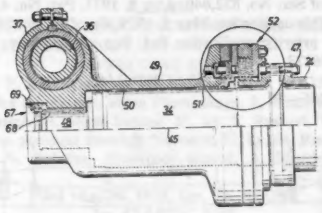
L-shaped portion capable of basal as well as lateral support of a board or the like, and having an integral handgrip lever portion extending upwardly a considerable distance and outwardly at an angle to said axis, said lever being capable of being grasped for greatly amplifying leverage in forcing said clamp portion into and out of engagement with said stake.

4,232,848

DRILL BOOM ARRANGEMENT

Erich V. Kimber, Handen, Sweden, assignor to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Apr. 10, 1979, Ser. No. 28,892
Claims priority, application Sweden, Apr. 11, 1978, 7804052
Int. Cl.³ F16M *1/00*
U.S. Cl. 248—652 **18 Claims**



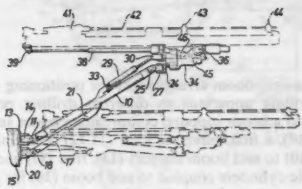
11. A drill boom arrangement comprising:
a boom support (13),
a boom (10) pivotably carried by said boom support,
a boom head (24) which carries an elongated rock drilling apparatus (40,41) and is itself pivotably carried by said boom,
a power operated self-braking turning device (34) for turning said elongated rock drilling apparatus relative to said boom head about an axis (45) which is substantially parallel with a vertical swinging plane of said elongated rock drilling apparatus,
a power operated coupling means (52) which is coupled in parallel with said turning device (34) between the boom head (24) and the rock drilling apparatus (40,41) said coupling means comprising a first friction coupling (52) for locking said elongated rock drilling apparatus relative to said boom head against rotation about said axis (45), and
a slip-coupling (67) arranged operatively in series with said self-braking turning device (34) and in parallel with said first friction coupling (52), so that the locking torques of said first friction coupling (52) and said slip coupling (67) are added.

4,232,849

DRILL BOOM ARRANGEMENT

Erich V. Kimber, Handen, and Axel L. Lundström, Hägersten, both of Sweden, assignors to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Apr. 10, 1979, Ser. No. 28,662
Claims priority, application Sweden, Apr. 11, 1978, 7804051
Int. Cl.³ F16M *1/00*
U.S. Cl. 248—654 **34 Claims**



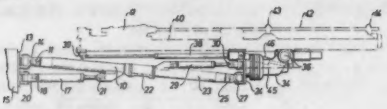
1. A drill boom arrangement with hydraulic parallel motion means for positioning an elongated rock drilling apparatus (40,41) to different drilling positions with respect to a boom support, comprising:
a boom support (13);
a boom (10) pivoted at the rear end thereof on a first universal joint (11,12) for lateral and vertical swinging;
first (17) and second (16) hydraulic cylinder means pivotally connected between said boom (10) and support (13) for swinging said boom;
a boom head (24) carrying said elongated rock drilling apparatus (40,41) and pivoted at the forward end of said boom (10) on a second universal joint (25,26) for lateral and vertical swinging;
third (28) and fourth (29) hydraulic cylinder means for swinging said boom head (24) and rock drilling apparatus (40,41);
a third universal joint (18,19) arranged on one side of the vertical swinging plane of the boom (10);
said boom support (13) carrying said first hydraulic cylinder means (17) for swinging about said third universal joint (18,19);
a fourth universal joint (30',31') arranged on the other side of the vertical swinging plane of the boom (10);
said third hydraulic cylinder means (28) being pivotally connected to said boom head (24) for swinging about said fourth universal joint (25,31);
a fifth universal joint (18',19');
said boom support (13) carrying said second hydraulic cylinder means (16) for swinging about said fifth universal joint (18',19');
a sixth universal joint (30,31) on the opposite side of the vertical swinging plane of the boom (10) with respect to said fifth universal joint;
said fourth hydraulic cylinder means (29) being pivotally connected to said boom head (24) for swinging about said sixth universal joint (30,31);
a hydraulic circuit including conduit means connecting said first hydraulic cylinder means (17) with said third hydraulic cylinder means (28) for hydraulically slave coupling thereof and conduit means connecting said second hydraulic cylinder means (16) with said fourth hydraulic cylinder means (29) for hydraulically slave coupling thereof whereby to maintain substantially parallel displacement of said rock drilling apparatus (40,41) during positioning thereof.

4,232,850

DRILL BOOM ARRANGEMENT

Erich V. Kimber, Handen, and Nils Hökby, Enskede, both of Sweden, assignors to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Apr. 10, 1979, Ser. No. 28,891
Claims priority, application Sweden, Apr. 11, 1978, 7804054
Int. Cl.³ F16M 1/00
U.S. Cl. 248—654 10 Claims



1. In a drill boom arrangement for positioning an elongated rock drilling apparatus to different drilling positions with respect to a boom support, comprising a boom support (13), a boom (10), a first universal joint (11,12) connecting said drill boom (10) to said boom support (13), first (17) and second (16) hydraulic cylinders coupled to said boom (10) for pivoting said boom in a vertical swinging plane, and second (18, 19) and third (18^1, 19^1) universal joints connecting respectively said first and second hydraulic cylinders (17, 16) to said boom support (13),

the improvement wherein:

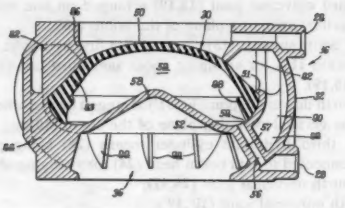
said second and third universal joints (18, 19 and 18^1, 19^1) are located on different sides of the vertical swinging plane of said boom (10) so as to provide means for swinging said boom both laterally and vertically during extension and contraction of solely either one of said first and second hydraulic cylinders.

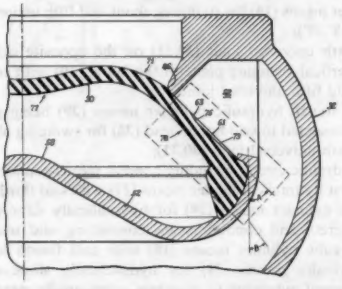
4,232,851

FLUID CONTROL VALVE AND LINER THEREFOR

Dwight N. Johnson, El Toro, Calif., assignor to Textron Inc., Providence, R.I.

Continuation-in-part of Ser. No. 730,962, Oct. 8, 1976, Pat. No. 4,198,029. This application Feb. 6, 1979, Ser. No. 10,141
Int. Cl.³ F16K 31/126
U.S. Cl. 251—61.1 7 Claims





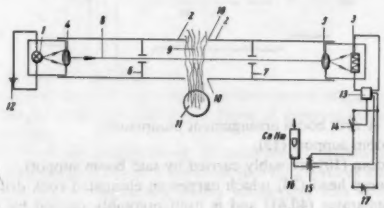
1. In a valve for controlling fluid flow through a conduit including a housing defining an inlet opening, a substantially coaxial outlet opening and an interior cavity therebetween, a baffle extending transversely across the central portion of the cavity to define an annular passageway for the flow of fluid from the inlet opening to the outlet opening, a plurality of ribs extending from the periphery of the baffle toward the inlet opening of the housing to provide a generally frustoconical grill having a plurality of ports therein, an elastomeric, concavo-convex liner disposed on the upstream side of the baffle with its peripheral edge in sealing relation with the periphery of the baffle so as to define a control chamber between the liner and the baffle, the inner surface of said grill and the outer surface of said liner being in confronting relation, the baffle having a central protuberance projecting toward the liner upon which the liner is draped during inversion of the liner, and means for decreasing and increasing the fluid pressure in the control chamber, a decrease of the pressure in the chamber causing the liner to invert and to roll along the frustoconical grill from a closed position where all of the ports are covered by the liner to positions where progressively greater areas of the ports are exposed, thereby permitting controlled and progressively increasing fluid flow through the ports and through the annular passageway, an increase in the pressure of the chamber causing reverse movement of the liner, the improvement comprising disposing the inner surface of said grill and the outer surface of said liner so that with the valve in its closed position said surfaces are spaced apart from each other.

4,232,852

APPARATUS FOR CONTROL OF THE CARBURIZATION OF PARTS IN A VACUUM FURNACE

Ferdinand Limque, Berg en Dal, Netherlands, and Franz Bless, Kleve, Fed. Rep. of Germany, assignors to Ispen Industries International Gesellschaft mit beschränkter Haftung, Kleve, Fed. Rep. of Germany

Division of Ser. No. 822,840, Aug. 8, 1977, Pat. No. 4,168,186. This application May 2, 1979, Ser. No. 35,126
Claims priority, application Fed. Rep. of Germany, Aug. 12, 1976, 2636273
Int. Cl.³ C21D 1/45
U.S. Cl. 266—80 5 Claims



1. An apparatus for the control of the carburizing of parts under vacuum in a vacuum furnace, in which as a carbon carrier a hydrocarbon gas addition is introduced controlled into the furnace, comprising

means for operatively detecting the occurrence of a soot mist formation in the furnace,

means operatively connected to said detecting means for feeding the hydrocarbon gas addition into the furnace when said detecting means does not detect the soot mist formation,

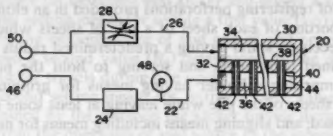
said detecting means for at least partially interrupting said feeding means and the feeding of the hydrocarbon gas addition into the furnace upon the detection of the occurrence of the soot mist formation, and for activating said feeding means again to feed the hydrocarbon gas addition into the furnace when the soot mist formation decays.

4,232,853

STEEL STOCK COOLING APPARATUS

Seiji Bando, and Ebata Sadao, both of Okayama, Japan, assignors to Kawasaki Steel Corporation, Hyogo, Japan

Filed Jun. 28, 1978, Ser. No. 919,851
Claims priority, application Japan, Jul. 4, 1977, 52-89032; Aug. 22, 1977, 52-112674
Int. Cl.³ C21D 1/62
U.S. Cl. 266—114 7 Claims



1. A steel stock cooling apparatus wherein a mixture of water with air is injected onto steel stocks for cooling, said apparatus comprising:

a main body;

injection pipes which are each communicated at one end thereof with a water supply section and each inject at the other end thereof water supplied from said water supply section;

at least one air introducing hole communicated with an air supply section is formed at the intermediate portion of each of the injection pipes;

said water supply section and air supply section are holes formed in said main body, respectively; and

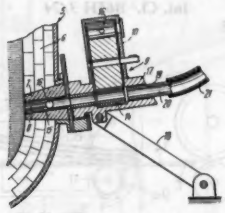
the axes of said holes are in parallel to each other.

4,232,854

METHOD OF INTRODUCING POWDERED REAGENTS INTO MOLTEN METALS AND APPARATUS FOR EFFECTING SAME

Dzhondo F. Barbakadze, ulitsa Gldanskaya, 6, kv. 35, Tbilisi; Mamuka S. Mindeli, ulitsa Pionerskaya, 8, Rustavi; Petr G. Macharashvili, ulitsa Lenina, 27, kv. 8, Rustavi; Vazha V. Rusidze, prospekt Druzhby Narodov, 57, kv. 64, Rustavi, and Otari N. Suladze, Pionersky proezd, 3, Rustavi, all of U.S.S.R.

Filed May 26, 1978, Ser. No. 909,990
Int. Cl.³ C21C 5/48
U.S. Cl. 266—266 3 Claims



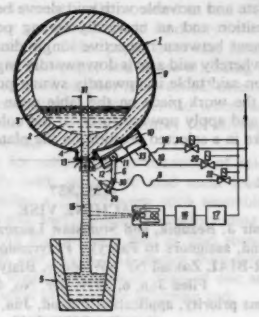
1. A method of introducing powdered reagents into a molten metal in a stream of carrier gas through a tuyere disposed in a refractory lining of a metallurgical vessel, consisting in introducing powdered reagents into the molten metal at a feed rate of 0.04 to 0.6 kg per sec. under a pressure of carrier gas which is 1.8 to 4.0 times the static pressure of molten metal above the tuyere, with the powder-to-carrier-gas ratio being 3 to 35 kg per cubic meter.

4,232,855

TAP-HOLE CLOSING ARRANGEMENT

Johann Hartl, Linz, Austria, assignor to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed Sep. 12, 1979, Ser. No. 74,882
Claims priority, application Austria, Oct. 4, 1978, 7147/78
Int. Cl.³ C21C 5/48
U.S. Cl. 266—272 4 Claims



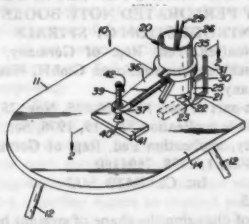
1. In a tap-hole closing arrangement provided at a metallurgical vessel for separating metal and slag and of the type including a tap hole wall defining a tap hole, a closure body insertable into said tap hole on leaving free an annular gap relative to said tap hole wall and including a compressed-gas conduit containing a mouth-side outlet opening, an outer jacket surrounding said closure body and tapering towards the mouth of said compressed-gas conduit, the improvement which is characterized in that said outer jacket is formed by a spherical-calotte-shaped face passing over into a frustroconical face on the side of the mouth so as to define a truncated cone, the height of said truncated cone being at least 1 time and at most 2.5 times the diameter of said mouth-side outlet opening of said compressed-gas conduit, and the aperture angle of said truncated cone amounting to at least 15 and at most 70°.

4,232,856

WORK HOLDING TABLE

Timothy J. Eichfeld, and Horace C. Disston, Jr., both of Pennsauken, N.J.

Continuation-in-part of Ser. No. 907,093, May 18, 1978, Pat. No. 4,140,308, which is a continuation-in-part of Ser. No. 6,095, Jan. 24, 1979. This application Feb. 16, 1979, Ser. No. 12,603
Int. Cl.³ B25B 1/00
U.S. Cl. 269—93 7 Claims



1. A work holding table comprising an elevated plate defining a table top, a yoke having a throat sized large enough to shiftably receive the edge margin of said plate for movement of said yoke to a selected position along the plate margin, a column upstanding from said yoke above and over said plate, said throat being further sized small enough to firmly cock the yoke on the plate margin upon upward force applied to said column,

a sleeve having an internal dimension greater than the external dimension of and loosely circumposed about said column for sliding therealong and tiltable about a generally horizontal axis between a longitudinal position lowered relative to and slidable on the column and a canted position raised relative to and jammed against upward movement along the column, said sleeve being releasably contractible about said column to urge the sleeve from its canted position toward its longitudinal position, an arm extending from said sleeve for location over said plate and movable with said sleeve between an outstanding position and an upwardly swung position upon sleeve movement between respective longitudinal and canted positions, whereby said arm is downwardly engagable with a work piece on said table in upwardly swung position to releasably clamp the work piece on the table upon contraction of said sleeve and apply upward force to the column to firmly cock the yoke in a selected position on the plate margin.

4,232,857

MACHINE VISE

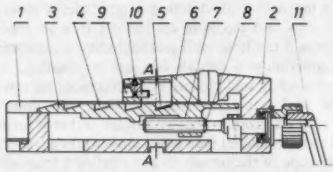
Slawomir J. Bezubik, and Stanislaw Laszcz, both of Bialystok, Poland, assignors to Fabryka Przyrzadow i Uchwytow PONAR-BIAL Zaklad Nr 1-Wiodacy, Bialystok, Poland

Filed Jun. 6, 1979, Ser. No. 47,825

Claims priority, application Poland, Jun. 17, 1978, 207728

Int. Cl.³ B25B *1/12*

U.S. Cl. 269—212 **1 Claim**



1. A machine vise apparatus having a body, a stationary jaw disposed at a terminus of said body, guide means disposed in said body having a movable strip formed of a movable jaw, adapted to cooperate therewith and move in said guide means, and a lead screw for registration with said movable strip, said apparatus comprising: a series of thrust recesses formed on the upper surface of said movable strip, a securing catch disposed in said movable jaw whereby, said recesses accommodate said securing catch which is in mesh with a driving means, and a threaded hole formed at the lower surface of said movable strip, adapted to cooperate with said lead screw.

4,232,858

METHOD AND MEANS FOR MANIPULATING MARGINALLY PERFORATED NOTE BOOKS PRIOR TO INTRODUCTION OF SPIRALS

Paul Fabrig, Neuffen, Fed. Rep. of Germany, assignor to Womako Maschinenkonstruktionen GmbH, Nürtingen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 854,835, Nov. 25, 1977, Pat. No. 4,157,821. This application Sep. 19, 1978, Ser. No. 943,814

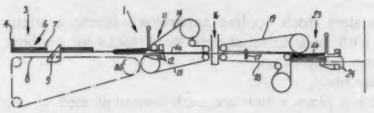
Claims priority, application Fed. Rep. of Germany, Oct. 9, 1968, 1817815; Feb. 1, 1978, 2804180

Int. Cl.³ B42B *5/12*

U.S. Cl. 270—53 **36 Claims**

1. A method of changing the shape of straight holes consisting of registering perforations provided in an elongated marginal portion of each sheet of a pile of sheets which are about to receive a spiral having a predetermined radius and a predetermined helix angle and serving to hold the sheets of the pile together, comprising the steps of moving at least some sheets of said pile in a first direction substantially at right angles to the respective elongated marginal portions and moving at least some sheets of said pile in a second direction which is substantially parallel to the respective elongated marginal portions whereby the movements of sheets in said first direction result in conversion of said straight holes into substantially V-shaped holes whose configuration resembles the projection of a convolution of said spiral into a plane which is normal to the axis of said spiral, and the movements of sheets in said second direction result in inclination of said holes with respect to the planes of said sheets at an angle which at least approximates said helix angle.

9. An arrangement for changing the shape of straight holes consisting of registering perforations provided in an elongated marginal portion of each sheet of a pile of sheets which are about to receive a spiral having a predetermined radius and a predetermined helix angle and serving to hold the pile together, comprising a holder having means for gripping the outermost sheets of the pile while leaving at least some of the holes exposed; and aligning means including means for moving



at least some sheets of the pile in said holder in a first direction substantially at right angles to the respective elongated marginal portions and for moving at least some sheets of the pile in said holder in a second direction which is substantially parallel to the marginal portions of the sheets whereby the movements of sheets in said first direction result in conversion of said straight holes into substantially V-shaped holes whose configuration resembles the projection of a convolution of said spiral into a plane which is normal to the axis of the spiral, and the movements of sheets in said second direction result in inclination of said holes with respect to the planes of said sheets at an angle which at least approximates said helix angle, said moving means comprising at least two mandrels disposed at the opposite sides of the pile in said holder means for imparting to said mandrels a composite movement including introducing each mandrel into a hole from the respective side of the pile in said holder and pivoting at least one mandrel with respect to the other mandrel.

4,232,859

BLANK FEEDING APPARATUS

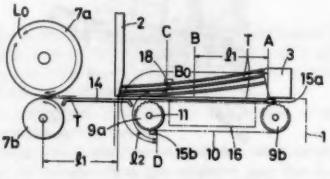
Masateru Tokuno, Nishinomiya, Japan, assignor to Rengo Kabushiki Kaisha (Rengo Co., Ltd.), Osaka, Japan

Filed Jan. 19, 1979, Ser. No. 5,016

Claims priority, application Japan, Jan. 27, 1978, 53/9719; Feb. 24, 1978, 53/21340

Int. Cl.³ B65H *3/24*

U.S. Cl. 271—35 **1 Claim**



1. Apparatus for feeding blanks of paperboard or the like one after another from a stack of blanks to processing rolls, said apparatus comprising:

an endless conveyor means disposed under said stack of blanks for feeding blanks one after another from said stack to said processing rolls,

at least one kicker means secured on said endless conveyor

means for pushing the rear end of the blank at the bottom of said stack toward said processing rolls,

motor means for driving said conveyor means,

a first transducer means for generating pulses (ϕ_A), the number thereof being proportional to the distance the surface of one of said processing rolls has rotated,

a second transducer means for generating pulses (ϕ_B), the number thereof being proportional to the distance the conveyor means has travelled,

a sensor for detecting said kicker and giving a signal,

a first setting means for setting a first value (Lo) determined by the circumference of said one of said processing rolls and a second value (B_o) determined by the distance the kicker travels during one cycle,

a second setting means for setting a third value (l_2) determined by the distance the kicker travels during the time from the operation of said sensor to the stopping thereof,

computation control means for receiving said first and second values and the pulses from said first transducer means and the pulses from said second transducer means and performing a computation expressed by ($Lo-Bo-\phi_A+\phi_B$), to determine an error signal,

combining means for combining together said error signal and a voltage proportional to the signal from said first transducer means,

stop control means responsive to the signal from said sensor for subtracting the pulses from said second transducer from said third value,

means for selecting the higher one from the two signals, that from said combining means and that from said stop control means, and comparing it with a voltage proportional to the speed of the conveyor means and producing a speed command signal proportional to the difference therebetween, and

motor control means for receiving said speed command signal to control said motor means so that one cycle of kicker operation will be completed while said one of said processing rolls makes a full turn, said one cycle including the acceleration, tuned-run and deceleration periods.

4,232,860

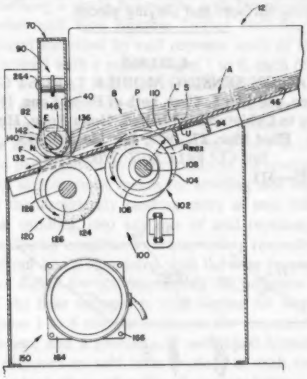
PAPER FEEDER

Frank H. Brown, Norwich, N.Y., assignor to Automecha Ltd., Oxford, N.Y.

Filed Oct. 20, 1978, Ser. No. 953,835

Int. Cl.³ B65H *3/06, 3/46*

U.S. Cl. 271—119 **13 Claims**



1. A friction feeder comprising:

a base;

a feed tray on said base;

a paper stop assembly releasably mounted on said base;

a main feed wheel assembly mounted on said base adjacent said feed tray;

a stone wheel assembly mounted on said base to be adjacent said feed wheel assembly for accepting paper from said feed tray to move such paper from said feed tray, said stone wheel assembly including a mounting shaft;

an eccentric wheel assembly mounted on said base adjacent said feed tray and including a drive shaft mounted on said base and a wheel eccentrically mounted on said drive shaft to contact paper contained in said feed tray in a manner which lifts a portion of that paper from said feed tray to define a bulge in that paper and cause a leading edge of such paper to tilt with respect to a vertical orientation;

a drive means connected to said eccentric wheel assembly and to said main feed wheel assembly for driving those two assemblies; and

adjusting means for adjusting the location of said stone wheel assembly with respect to said main feed wheel assembly to define a gap between such assemblies of a predetermined size, said adjusting means including a crank and an adjusting rod on each end of said stone wheel mounting shaft and connecting means connecting said adjusting rods together so that rotation of one adjusting rod causes rotation of the other adjusting rod.

4,232,861

SORTING METHOD AND MACHINE

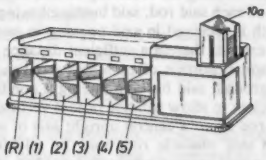
Michael Maul, Schwabach near Nurnberg, Fed. Rep. of Germany, assignor to Maul Lochkartengerate GmbH, Schwabach, Fed. Rep. of Germany

Filed Dec. 9, 1977, Ser. No. 859,212

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1976, 2658171

Int. Cl.² B65H *39/10*

U.S. Cl. 271—287 **6 Claims**



1. A method of sorting sheets comprising the steps of feeding to an infeed station successive ones of M groups of sheets, each group consisting of N identical sheets, the sheets within each group differing from those of the others of the groups; and

converting these M×N sheets into N sets, each set containing M sheets, each sheet within a set coming from a different respective one of the M groups, the sequence of sheets within each set corresponding to the sequence in which the M groups were fed to the infeed station, this conversion comprising:

performing a first sorting operation, independently of routing information, if any, provided on the sheets, by depositing successive ones of the sheets of the successive groups of sheets onto successive ones of a limited number of collecting stations in a cyclical manner utilizing cyclically operating counting means to control performance of the first sorting operation, the number of collecting stations utilized being smaller than the number N of sets to be formed, until all M×N sheets have been deposited onto collecting stations,

then performing at least one further sorting operation, likewise independently of routing information, if any, provided on the sheets, each further sorting operation comprising

first taking the slacks accumulated at the collecting stations out of the collecting stations and feeding them back in into

the infeed station in the order in which successive collecting stations received sheets during the preceding sorting operation,

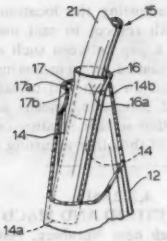
and then performing another such sorting operation, again utilizing cyclically operating counting means to control performance of the sorting operation, until all M×N sheets have again been deposited onto collecting stations.

4,232,862

OBSTACLE SAFETY DEVICE

Michael Mason, 604 Primrose La., Schaumberg, Ill. 60194

Filed Feb. 1, 1979, Ser. No. 8,683
Int. Cl.³ A63B 5/02
U.S. Cl. 272—102 **1 Claim**



1. An obstacle device set comprising:

a cone-shaped support means having an opening in a top thereof;

a plurality of curved obstacle rods each having a different radius of curvature and each having a vertical portion and a horizontal portion; and

a flanged bushing for receiving an end of each vertical portion of each said rod, said bushing having a shank portion which is received in said opening in said support means and extends therein a sufficient distance to maintain said horizontal portion of each said rod generally parallel to the ground, said bushing having a coefficient of friction sufficient to allow rotation of said vertical portion of each said rod about a central upright axis of said cone,

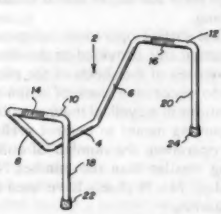
such that said obstacle rods may be selectively removably engaged in said support means to provide a set of obstacles of varying heights.

4,232,863

FITNESS BAR

Herschel Roach, Clarksville, Tex., assignor to O & R Products, Incorporated, Clarksville, Tex.

Filed May 19, 1978, Ser. No. 907,484
Int. Cl.³ A63B 1/00
U.S. Cl. 272—111 **8 Claims**



1. A fitness bar for supporting a person during performance of physical exercise, comprising:

a pair of transverse spaced apart beam bars;

a pair of support legs extending downwardly from the beam bars for engaging a supporting surface to support one end of the fitness bar, said support legs being spaced apart a distance substantially the same distance as said beam bars;

a base bar for being disposed along the supporting surface between said beam bars and support legs to support the other end of the fitness bar;

a pair of support arms extending upwardly and outwardly at an angle from the distal ends of said base bar between said beam bars and support legs, said beam bars extending laterally from the upper ends of said support arms; and

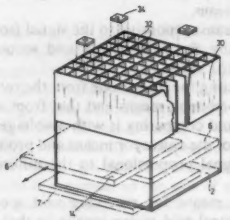
said transverse beam bars being spaced apart a distance to allow a person to perform physical exercise by grasping said beam bars and moving through strenuous positions between said beam bars.

4,232,864

GAME APPARATUS WITH MOVABLE SUPERIMPOSED BOARDS AND VIEWING STRUCTURE

James J. Yaworsky, 133 Richmond St. West, Toronto, Ontario, Canada (M5H 2LR)

Filed Jan. 2, 1979, Ser. No. 358
Int. Cl.³ A63F 3/00, 9/00
U.S. Cl. 273—241 **7 Claims**



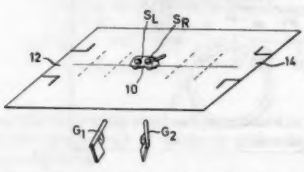
1. A game apparatus comprising at least two corresponding playing surfaces, playing pieces adapted to releasably engage said playing surfaces, means to superimpose said playing surfaces, wherein at least one of said playing surfaces is movable from the superimposed position and wherein said playing pieces and said playing surfaces are at least partially transparent providing observation of non-overlapping playing pieces when said playing surfaces are superimposed, the apparatus further including a viewing means having a planar network structure defining open apertures and means to cover such apertures, said viewing means located above superimposed playing surfaces to provide at least partial viewing of superimposed playing surfaces and playing pieces.

4,232,865

RADIATION SENSING MOBILE TARGET GAME

Lim B. Chen, and Lim L. Cher, both of Hong Kong, Hong Kong, assignors to Cybiotronics Limited, Hong Kong, Hong Kong

Filed Mar. 27, 1978, Ser. No. 890,493
Int. Cl.³ F41J 5/02, 7/00, 9/02
U.S. Cl. 273—311 **8 Claims**



1. A game for testing the ability of players, which comprises:

a mobile target;

means for emitting a narrow beam of radiation, said radiation

emitting means comprising a gun emitting a single pair of pulses upon each actuation of a trigger thereof;

sensing means on said mobile target responsive to said radiation of said emitting means and comprising a radiation detector and a circuit for detecting said emitting pulses, said circuit including gating means for gating a second received pulse under the control of a first received pulse such that said circuit is only responsive to pulses of radiation having a predetermined separation in time;

drive means on said mobile target for displacing said mobil target; and

control means for controlling said drive means in response to sensed radiation, said control means being set to cause said mobile target to undergo a predetermined change in velocity for a predetermined length of time in response to said sensed radiation.

4,232,866

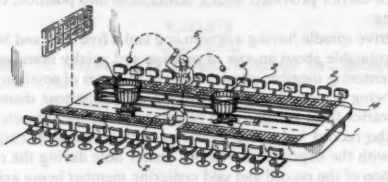
APPARATUS FOR PLAYING A GAME OF CHANCE

Attilio Pennachio, 14 Amber Cir., Las Vegas, Nev. 89106

Filed Oct. 2, 1978, Ser. No. 947,630

Int. Cl.[3] A63B *63/02*; A63F *5/02*; F41J *5/04*

U.S. Cl. 273—374 **11 Claims**



1. A gambling apparatus comprising a generally U-shaped table member having a pair of spaced apart substantially parallel table sections and a plurality of seats disposed along the outside portions of said sections for accommodating numerous participators; receptacle means disposed between said table sections, said receptacle means including a basket and a generally circular base member, said base member having formed therein six equally spaced circular recesses, the centers of said recesses defining a circle concentric with the periphery of the base member said base member further including a central closed mound encircled by said recesses, each of the recesses being associated with a number from 1 to 6, each of said numbers from 1 to 6 being indicated on the outside of the receptacle adjacent its associated recess, each of said numbers from 1 to 6 further being indicated on said mound portion adjacent its respective associated recess; a ball which may be directed by one of said participators to said receptacle for randomly falling into one of said recesses; means for leveling said base member to ensure the completely random entry of said ball into said one, or, at random, into any one of said recesses; a display having six display conditions corresponding respectively to the numbers from 1 to 6 associated with the base recesses; electrical control means for communicating the presence of the ball in one of the base recesses to said display for displaying the number from 1 to 6 corresponding to the respective ball containing recess; and a plurality of individual layouts, each of which is disposed on said table sections at each seat, each of said layouts including a plurality of separate betting zones each of which denotes a manner of winning and the payoff for the respective manner of winning, said betting zones including zones for each number and various groups or combinations of numbers.

4,232,867

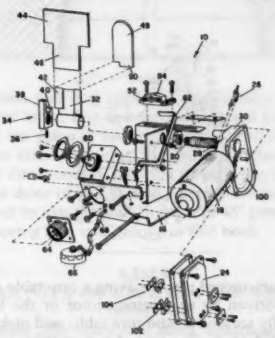
PORTABLE TARGET RAISING AND LOWERING DEVICE SYSTEM

Edward D. Tate, Sr., 165 Charles Cir., Seaford, Va. 23696

Filed Mar. 29, 1979, Ser. No. 24,915

Int. Cl.[3] F41J *7/00, 7/02*

U.S. Cl. 273—406 **8 Claims**



5. A portable training system having devices for raising and lowering a replaceable target used in gunnery practice, said device comprising:

a. a rotatable control shaft;

b. a target holder freely mounted on said control shaft and adapted to hold the replaceable target;

c. a control arm rigidly mounted on said control shaft for engaging said target holder;

d. a first remotely controlled motor means for rotating said control shaft in a first direction to cause rotational movement of said control arm, and corresponding rotational movement of said target holder, between a first lowered position and a second raised position and for rotating said control shaft in a second direction to cause rotational movement of said control arm from the second raised position to the first lowered position;

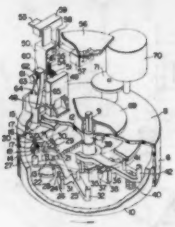
e. a second remotely controlled motor means for moving said target holder from the second raised position to the first lowered position; and

f. remote control means for controlling said first and second motor means such that in first mode of operation using a replaceable target of a first type said control arm engages said target holder as both said control arm and said target holder move from the first lowered position to the second raised position, and said control arm engages the replaceable target and hence said target holder as said control arm and said target holder move from the second raised position to the first lowered position; and such that in second mode of operation using a replaceable target of a second type, said contol arm engages said target holder as both said control arm and said target holder move in said first direction from the first lowered position to the second raised position and said control arm disengages from said target holder when said control arm moves in said second direction leaving said target holder in the second raised position said target holder being moved from the second raised position to the first lowered position by said second remotely controlled motor means.

4,232,868
STATIONARY RECORD PLAYER

Yasushi Okamura, and Kiichiro Tanaka, both of Fukuoka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 18, 1978, Ser. No. 952,389
Claims priority, application Japan, Oct. 19, 1977, 52-126266; Oct. 19, 1977, 52-126267; Oct. 19, 1977, 52-126268; Feb. 20, 1978, 53-18963; Mar. 6, 1978, 53-25568; Mar. 23, 1978, 53-33864; Mar. 24, 1978, 53-34455
Int. Cl.³ G11B 3/40
U.S. Cl. 274—9 C 10 Claims

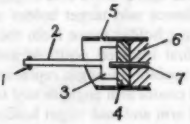


1. A stationary record player having a turn table adapted to be rotatively driven by an electric motor or the like, and a pickup pivotally secured to said turn table, said pickup having a stylus adapted to move along the recording groove in a stationary record medium when said pickup is rotated together with said turn table, so as to reproduce the signal on said record medium, characterized by comprising a lift member adapted to detect the arrival of said stylus at the final position of reproduction, said lift member including a lift lever being pivoted to said turn table, one end of said lift lever being held by the pickup until the pickup reaches a final inward position whereby said one end is released allowing the remaining end of said lift lever to be pivoted upward; a play lever for operating a switch for supplying current to the electric motor in response to an actuation thereof; locking mechanism for maintaining actuation of said play lever; and an automatic release mechanism connected to said locking mechanism, having an activating arm disposed at the same radial position along the turn table as the remaining end of said lift lever and located above the remaining end of the lift lever operated in response to the release of said lift lever whereby said play lever is released stopping said electric motor.

4,232,869
PICKUP CARTRIDGE

Takashi Wakabayashi, Ibaragi, and Kazuhisa Morimoto, Settsu, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Aug. 31, 1978, Ser. No. 938,497
Claims priority, application Japan, Sep. 8, 1977, 52/108540; Sep. 9, 1977, 52/109312
Int. Cl.³ G11B 3/18
U.S. Cl. 274—37 4 Claims

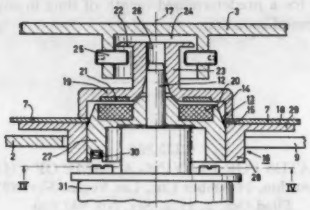


1. A pickup cartridge comprising: a cantilever having a stylus mounted on one end portion thereof; and a damper material supporting the other end portion of said cantilever, said damper material being formed of an elastomer comprising a polymer blend of a silicone rubber polymer and polyisobutylene the blend ratio of said polymer blend is between 10 and 60 weight parts of said polyisobutylene on the basis of 100 weight parts of said silicone rubber polymer.

4,232,870
CLAMPING DEVICE FOR A ROTATABLE INFORMATION CARRYING RECORD

Johannes A. Iemenschot, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 734,659, Oct. 21, 1976, abandoned.
This application Jun. 11, 1979, Ser. No. 47,394
Claims priority, application Netherlands, Aug. 24, 1976, 7609375
Int. Cl.³ G11B 17/02; G01D 15/32; G11B 25/04, 3/62
U.S. Cl. 274—39 R 2 Claims



1. A clamping device for clamping a rotatable disc-shaped record carrier provided with a center hole into position, comprising:

a drive spindle having a driven end and a free end, and being rotatable about an axis of rotation and axially immovable;

a centering member pivotable about said axis of rotation and being provided with a centering surface whose diameter varies from smaller than to greater than the diameter of the record hole, said centering surface being in contact with the edges of said record center hole during the rotation of the record and said centering member being axially immovable;

record loading means movable to a position opposite the centering member and bearing on the record in this position for pressing the centering surface against the edge of the record center hole;

record carrier means provided with a record support surface radially spaced from said centering surface of said centering member for immediately confining said record carrier to a position perpendicular to the axis of rotation of said drive spindle, and for lowering the record carrier onto said centering surface while maintaining the perpendicular relationship between the record carrier and the axis of rotation of said drive spindle during axial and rotational motion of the record carrier means;

and means for axially resiliently biasing the record carrier means toward the record carrier with a force less than that necessary to overcome the weight of the record combined with the pressing force of the record loading means, thereby facilitating the lowering of said record carrier.

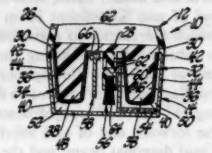
4,232,871
MANUAL RECORD CLEANER

Richard C. Horian, 27234 Westland, Detroit, Mich. 48240, and James G. Horian, 7340 Indiana, Dearborn, Mich. 48126

Filed Nov. 1, 1976, Ser. No. 737,295
Int. Cl.³ G11B 3/58
U.S. Cl. 274—47 14 Claims

1. A manual record cleaner comprising: a manually grasped body having leading and trailing projections spaced from each other; each projection being of a rigid material and having a blunt end including a covering of a soft pile for cleaning records during relative movement between the cleaner and the records while in an engaged condition; a brush located between the leading and trailing projections in a spaced relation-

ship to each projection; said brush having bristles that extend away from the body to a plane extending between the soft pile covered blunt ends of the rigid projections so as to loosen dust accumulation from a record being cleaned with the projection coverings slidingly engaging the record; said brush bristles having a flexible length that is a plurality of times the thickness of the soft pile coverings on the blunt ends of the rigid projections; the rigid blunt ends on the projections and the pile cover-



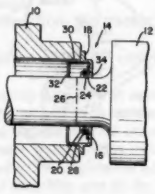
ings thereon cooperating to control the degree to which the bristles extend into the record grooves so that effective cleaning can be achieved without damaging the sound track surfaces of the record grooves; and an upwardly opening receptacle for mounting the cleaner body with the projections and brush projecting downwardly thereinto, said cleaner body closing the receptacle when mounted thereon to retain any cleaning liquid dampness that may be present on either projection covering.

4,232,872

OIL SEAL

Stanley M. Miyabara, 1002 Gen. McArthur Dr., Brentwood, Tenn. 37027

Filed Apr. 2, 1979, Ser. No. 26,411
Int. Cl.³ F16J *15/32*
U.S. Cl. 277—47 **2 Claims**



1. An annular seal for preventing oil leakage, said seal adapted to fit around a driven member as a unitary item and comprising two outer right-angled shoulders each of which comprises a top portion and a side portion substantially perpendicular to said top portion, said shoulders being joined together by a flanged projecting neck, and an inner V-shaped lip, one V arm of which extends as a lengthened section substantially perpendicular to said top portion of one of said shoulders and fits against said side portion of said one of said shoulders in a parallel manner, the top portion of the other of said shoulders being adapted to fit snugly against a housing, said side portion of said other of said shoulders being shorter than said side portion of said one of said shoulders, and said V-shaped lip being adapted to fit at its point firmly against said driven member.

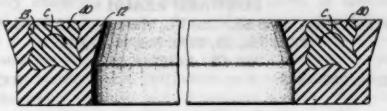
4,232,873

RING SPRING FOR COMPOSITE MACHINERY SEALS AND METHOD OF MANUFACTURING SAME

Jules M. Hock, 16056 Arbela Dr., Whittier, Calif. 90603

Filed Mar. 12, 1979, Ser. No. 19,848
Int. Cl.³ F16J *15/32, 15/10*
U.S. Cl. 277—206 A **5 Claims**

1. An elastomeric resilient ring spring for use in an annular elastomeric boot of the U-cup type having an exposed annular groove which is generally x-shaped, the surface defining the annular groove comprising opposed, inwardly directed, first and second lobes extending into and defining the minimum transverse dimension across said groove, the tips of said first and second lobes being generally aligned with each other, and a third inwardly directed lobe extending from the base of said groove, perpendicular to said first and second lobes, midway



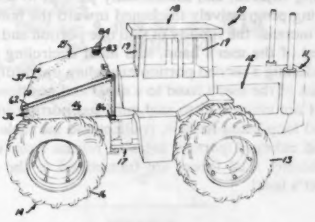
therebetween, said ring spring being generally +-shaped including four lobes, first and second opposed lobes extending parallel to the plane of said ring spring, third and fourth opposed lobes extending perpendicular to the plane of said ring spring, the dimensions of said ring spring being approximately the same as those of said groove whereby rotation of said ring spring about its axis through an angle of 45° permits mating of said ring spring into said groove in said boot.

4,232,874

TANK MOUNTED ON BACK OF FOUR-WHEEL DRIVE TRACTOR

Stuart Ystebo, 2421 - 16th Ave. South, Moorhead, Minn. 56560

Filed Nov. 17, 1978, Ser. No. 961,736
Int. Cl.³ B65D *11/22*; B60P *3/22*
U.S. Cl. 280—5 A **48 Claims**



1. A tank mountable on a rear drive unit of a tractor with a mounting bracket, said drive unit having rear drive wheels comprising: a one-piece body of plastic material reinforced with fibers having a chamber for storing liquid, said body comprising a bottom wall having a front transverse portion, a rear transverse portion, and a plurality of first ribs projected upwardly into the chamber, each first rib extended from the front portion to the rear portion of the bottom wall, each first rib having a bead of foamed plastic covered with plastic material, a front wall joined to the front transverse portion, a rear wall joined to the rear transverse portion, said front wall having a height greater than the height of the rear wall, side walls joined to the bottom wall and front and rear walls, a top wall joined to the front wall, rear wall, and side walls to cover the top of the body and close the top of the chamber, said top wall being generally flat and sloping downward and rearward from the front wall toward the rear wall, said top wall being made of plastic material reinforced with fibers and having a plurality of laterally spaced second ribs projected downwardly into the chamber, each second rib extended from the front wall to the rear wall, each second rib having a bead of foamed plastic covered with plastic material, a plurality of upright baffle plates located in the chamber, each plate extended from the front wall to the rear wall and engageable with the bottom wall and top wall, means mounted on the top wall providing an inlet passage open to the chamber, said bottom wall and rear wall having central sections providing a downwardly directed well, second means mounted on the bottom wall providing an outlet

passage in the lower portion of the well open to the chamber, and means mounted on the rear wall for receiving liquid and discharging liquid into the tank chamber, said means mounted on the rear wall including tubular means located in the chamber for carrying liquid toward the end walls and discharging liquid to the end sections of the chamber.

4,232,875
SKI POLE GRIP WITH SELF HINGE FOR IMPROVED FORWARD REACH

Garry W. Klees, 9130 SE. 72nd Pl., Mercer Island, Wash. 98040
Filed Jan. 29, 1979, Ser. No. 7,046
Int. Cl.[3] A63C *11/22*
U.S. Cl. 280—822 8 Claims

1. A ski pole grip axially engaging the upper portion of a ski pole, said grip having a length in excess of the width of the user's hand, said grip comprising:

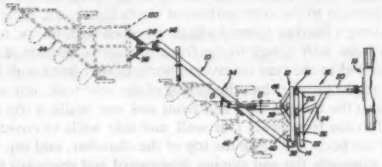
an upper enlarged head portion;

a body member adapted to be grasped by the user; and,

a hand encircling loop means flexibly attached at one end thereof to said body adjacent said enlarged portion and depending downwardly therefrom, one portion thereof lying adjacent and substantially parallel to said body and being progressively thickened toward the bottom thereof to increase the rigidity of said one portion and support the heel of the user's hand, said hand encircling loop means including a second portion extending upwardly across the back of the user's hand to a distal end positioned adjacent but not connected to said enlarged portion of said body, said loop being flexible, resilient and movable away from said enlarged portion so as to release from user's hand, whereby axial forces are transmitted to the heel of the user's hand.

4,232,876
GANG PLOW HITCH

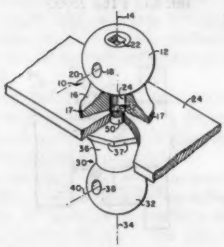
John S. Burres, Box 375, Condon, Oreg. 97823
Filed Feb. 8, 1979, Ser. No. 10,594
Int. Cl.[3] B62D *53/00*
U.S. Cl. 280—412 5 Claims



1. A gang plow hitch for at least one pair of multiple bottom gang plows of the type including forward transverse mounting beams, said plow hitch including a longitudinal beam having front and rear ends, said front end being adapted for universal connection to a draft vehicle, the rear end of said longitudinal beam including a horizontal transverse header beam supported therefrom for angular displacement about a horizontal axis transverse to said longitudinal beam and generally paralleling said header beam, one end of said transverse header beam projecting outwardly to one side of said longitudinal beam and including longitudinally spaced anchor means for pivotally attaching the forward transverse mounting beam of a forward gang plow thereto for angular displacement about a first axis paralleling said transverse header beam, a main horizontal diagonal beam pivotally anchored at its forward end to said one end of said header beam and inclined toward its rear end outwardly beyond the other side of said longitudinal beam, an elongated horizontal adjustable length adjustment beam, anchor means pivotally anchoring one end of said adjustment beam relative to said header beam for angular displacement relative thereto about an upstanding axis spaced intermediate the opposite ends of said header beam, attaching means attaching the other end of said adjustment beam to said diagonal beam for adjustment therealong to maintain said adjustment beam in position substantially paralleling the direction of intended movement of said hitch throughout limited angular adjustment of said diagonal beam relative to said header beam, an elongated longitudinal short couple beam, means universally coupling the forward end of said short couple beam to said rear end of said diagonal beam, and the rear end of said short couple beam including mounting means for rigidly mounting the forward transverse mounting beam of a rear gang plow to said short couple beam rear end, said diagonal beam being of a length in relation to the angulation thereof relative to said header beam to properly laterally space the forward and rear gang plows operatively associated therewith said rear gang plow projecting laterally outwardly of the other side of said longitudinal beam.

4,232,877
DUAL BALL TOWING HITCH

Russell E. Milton, 712 E. 4th St., Alturas, Calif. 96101
Filed Apr. 11, 1979, Ser. No. 29,023
Int. Cl.[3] B62D *53/00*
U.S. Cl. 280—415 A 5 Claims



1. A trailer hitch comprising

a first ball member comprising a first spheroid portion having a vertical axis of rotation,

a first base support portion connected to said first spheroid portion, said first base support portion having an axis of rotation coincident with said vertical axis of rotation of said first spheroid portion,

means defining a first hole in said first ball member, said first hole intersecting said vertical axis of rotation of said first spheroid portion, with the axis of rotation of said first hole perpendicular to said vertical axis of rotation of said first spheroid portion,

means defining a second hole projecting through said first base support portion a part of the distance through said first ball member, the axis of rotation of said second hole being coincident with the vertical axis of rotation of said first spheroid portion,

a second ball member comprising a second spheroid portion having a vertical axis of rotation,

a second base support portion connected to said second spheroid portion, said second base support portion having an axis of rotation coincident with said vertical axis of rotation of said second spheroid portion,

means defining a third hole in said second ball member, said

third hole intersecting said vertical axis of rotation of said second spheroid portion, with the axis of rotation of said third hole perpendicular to said vertical axis of rotation of said second spheroid portion,

a towbar attached to a vehicle, and

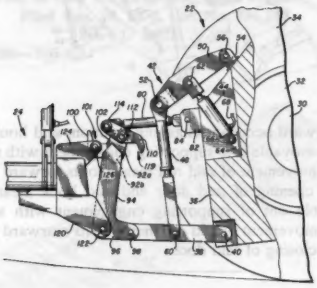
means for connecting said first ball member to said second ball member and to said towbar, with said vertical axis of said first spheroid portion coincident with the vertical axis of rotation of said second spheroid portion.

4,232,878

APPARATUS FOR COUPLING A TRACTOR AND FARM IMPLEMENT

George E. Moore, Jr., 1906 Field, San Angelo, Tex. 76902

Filed Jun. 14, 1978, Ser. No. 915,455
Int. Cl.[3] A01B *59/043*
U.S. Cl. 280—461 A 8 Claims



8. Apparatus for coupling a tractor to a trailing implement comprising:

a pair of lower trailing arms extending from the tractor toward the implement,

an upper arm extending from the tractor toward the implement,

attachment means for attaching the ends of said lower arms to the implement,

a coupling arm rotatably attached at one end to said upper arm and rotatably attached at an intermediate point to the farm implement at a point spaced from the point of connection of said lower trailing arms to the implement, and

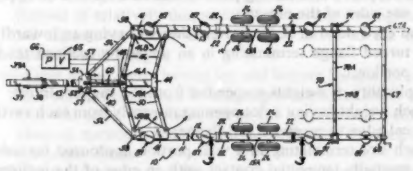
a limiter bar attached to the implement adjacent the point of connection of said coupling arm to the farm implement at the intermediate point on said coupling arm, and wherein said coupling arm extends beyond the connection of said coupling arm to the implement such that the extension of said coupling arm rotates toward said limiter bar as the implement rotates downwardly about the connection to the lower trailing arms.

4,232,879

EQUIPMENT TRAILER

Phillip E. Boxrud, Route 3, Madelia, Minn. 56062

Filed Feb. 9, 1979, Ser. No. 10,624
Int. Cl.[3] B60P *3/10*; B62D *53/06*
U.S. Cl. 280—656 12 Claims



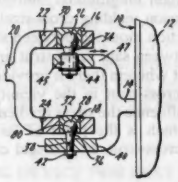
1. An equipment trailer comprising a pair of longitudinally extending frame members, means joining said frame members at a leading end thereof adapted to be connected to a prime mover, said means joining including a hitch pole assembly, link means mounted between said hitch pole assembly and each of said longitudinally extending frame members adjacent the leading ends thereof, including portions on the longitudinally extending frame members movably mounted relative to said hitch pole assembly, power means to move said movably mounted portions relative to the hitch pole to cause said longitudinally extending frame members to move in direction toward or away from each other under control of said power means to vary the spacing between said longitudinally extending frame members, at least one removable cross beam positioned rearwardly of said link means, each cross beam comprising telescoping first and second portions spanning the width between said longitudinally extending frame members, and support means at opposite ends of said cross beam to support the cross beam on the longitudinally extending frame members, said support means on at least one end of the cross beam comprising a hanger means including a latch member which fits over the top of the associated longitudinally extending frame member and having a portion passing to the outside of the associated longitudinally extending frame member, and means between at least one end of the cross beam and the hanger means to support the respective cross beam against lower side portions of the associated longitudinally extending frame member and adjacent the exterior side of said associated longitudinally extending frame member.

4,232,880

ADJUSTING SLEEVE FOR A WHEEL ASSEMBLY

Carroll D. Dickerson, New Hudson, and Robert W. Stevens, Garden City, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Apr. 9, 1979, Ser. No. 28,624
Int. Cl.[3] B62D *17/00*
U.S. Cl. 280—661 2 Claims



1. A vehicle wheel mounting assembly comprising;

an axle with lower and upper vertically spaced control arms;

a spindle mounting a wheel assembly;

said spindle having a lower and upper arm vertically spaced and pivotably connected to said lower and upper control arms;

a first ball joint mounted in said upper control arm;

a second ball joint mounted in said lower control arm;

a stud portion of one of said ball joints passing through an aperture in one of said arms of said spindle and rigidly secured thereto;

a sleeve mounted in a cylindrical aperture in the other of said arms of said spindle;

said sleeve having a substantially cylindrical outer surface adapted to rotate about in said cylindrical aperture of said spindle;

said sleeve having an axially exter. ling eccentric hole therethrough which has an axis parallel and offset with respect to the axis of the cylindrical outer surface;

said hole having a tapered section away from said second ball joint to receive a tapered section of a ball stud of said second ball joint;

said sleeve having an outer integral collar adjacent one end

and radially extending outward beyond said cylindrical outer surface forming a shoulder which is axially spaced from said spindle arm;

said sleeve having a slot axially extending from the top to the bottom of said sleeve and radially extending from said eccentric hole to said outer surface and through said outer collar allowing radial expansion of said sleeve when said tapered stud is pressed therein to press fit and frictionally lock said outer surface against a side of said cylindrical aperture in said spindle and said stud against sides of said hole in said sleeve to rigidly secure said stud to said spindle arm at a desired position.

4,232,881

SUSPENSION ARRANGEMENT FOR MOTOR VEHICLES

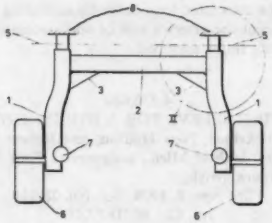
Hans J. Kölbel, Wolfsburg, and Harald Andres, Velpke, both of Fed. Rep. of Germany, assignors to Volkswagenwerk Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 28, 1978, Ser. No. 919,830

Claims priority, application Fed. Rep. of Germany, Oct. 8, 1977, 2735939

Int. Cl.³ B60G *11/18*

U.S. Cl. 280—721 **2 Claims**



1. In a vehicle suspension having wheels mounted to bending and torsion-resistant longitudinal control arms and a bending resistant, but torsion yielding cross-strut with a generally U-shaped cross section mounted between said control arms, and gusset plates between said cross-strut and said control arms, the improvement wherein there is provided a transverse corrugation on said cross-strut in the vicinity of the end of said gusset plate to influence the stress gradient of said cross-strut in said vicinity, which is the point of largest discontinuity in rigidity of said cross-strut, so that said cross-strut is strengthened overall.

4,232,882

MOTORIZED PASSIVE SEAT BELT SYSTEM

Robert L. Stephenson, Sterling Heights, Mich., assignor to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Sep. 20, 1977, Ser. No. 834,936

Int. Cl.³ B60R *21/10*

U.S. Cl. 280—804 **12 Claims**

1. In a passive seat belt system in a vehicle including a door and a seat belt adapted to be positioned about an occupant in a seat, one end of said belt being connected to a retractor and the other end of said belt being mounted to said vehicle, the improvement comprising:

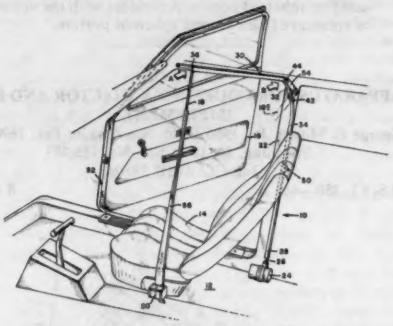
(a) rod means having one portion connected at said seat belt;

(b) hook means connected to said rod means and engageable with said belt;

(c) an electric motor to which one end of said rod means is drivingly connected;

(d) switch means in said vehicle actuated in response to opening and closing of said door, said switch means being in electrical connection with said motor so that when said switch means is actuated, said motor is actuated; and

(e) said rod means being extended from said motor and being moved to a forward position when said door is opened to thereby move said seat belt to a forward position permitting free ingress to and egress from said vehicle, with said hook means supporting a portion of said belt, and said rod means being moved by said motor to a rearward position when said door is closed to thereby move said seat belt to



a rearward occupant-engaging position, said hook means being movable into supporting engagement with said belt upon movement of said rod means to its forward position upon opening of said door and said hook means being movable out of supporting engagement with said belt upon movement of said rod means to its rearward position upon closing of said door.

4,232,883

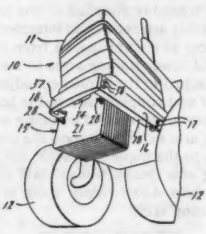
COUNTERWEIGHT ASSEMBLY FOR A VEHICLE

Clarence G. Bourgeous, Mt. Clemens, and Oliver G. Miller, Taylor, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Mar. 19, 1979, Ser. No. 21,938

Int. Cl.³ B62D *37/00*; B60K *5/02*

U.S. Cl. 280—759 **3 Claims**



1. A counterweight assembly for a vehicle having its engine supported on a chassis with a substantial portion of the engine overhanging one end of the chassis;

the counterweight assembly comprising an open-end support frame anchored to the chassis and extending longitudinally from the latter beneath the overhang of the engine;

the support frame having parallel side rails located on opposite sides of the chassis;

and each side rail at the bottom thereof having an inwardly turned flange terminating in an upwardly inclined track portion;

a plurality of weights suspended from the support frame;

each weight having a slot opening inwardly from each vertical edge to receive a rail flange;

each slot terminating in a wall portion contoured for substantially tangential contact with an edge of the inclined track portion of the side rail flange received in the slot;

the inclined track portions on the support frame flanges and the contoured wall portion of each slot in the weights co-acting to cause self-alignment of the weights with each other upon insertion of the weights into the support frame through the open end thereof and to minimize sliding resistance as the weights are moved in the direction of the chassis toward locating stop means;

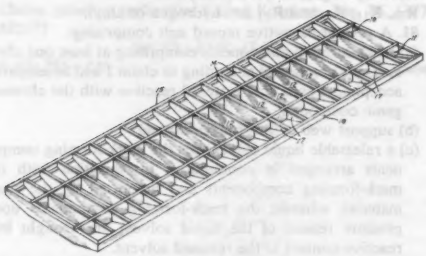
and securing means locking the weights in place on the support frame.

4,232,884

LIGHTWEIGHT TRAILER BED CONSTRUCTION

Merl DeWitt, 38 Carr St., Lakewood, Colo. 80226

Filed Aug. 24, 1978, Ser. No. 936,242
Int. Cl.[2] B62D *21/00*
U.S. Cl. 280—785 **6 Claims**



1. A lattice frame for a lightweight trailer comprising:

(a) at least two central channel members extending from end to end of the trailer, each said channel being formed of relatively lightweight metal plate with its longitudinal edges bent at approximately 90° providing flanges and a connecting web to form a channel;

(b) a plurality of central Z-shaped members of substantially the same width as said central channels spaced along said channels and secured thereto, each Z-shaped member formed of relatively thin metal plate with opposed edges bent in opposite directions forming flanges at an acute angle of less than 90° to the plane of the web between said flanges and an angle member secured at each end of the web secured to the web of said central channels;

(c) a plurality of outer Z-shaped members having opposed flanges at an acute angle to a web therebetween and having flanges on the ends of the web secured to said channels on the opposite side of said central Z-shaped members and extending outwardly and normally to said channels, said Z-shaped members being formed of relatively thin metal plate with opposed edges bent in opposite directions forming flanges at less than 90° to the plane of the web between said flanges;

(d) outside channels being secured to the outside ends of said outer Z-shaped members, each said outside channel being formed of relatively thin metal plate having its longitudinal edges bent in the same direction at 90° to the web between said flanges;

(e) a pair of end plates having top and bottom flanges formed by bending the top and bottom edges thereof at about 90°, said end plate being secured to the ends of said central channel members and said outside channels to complete the lattice frame;

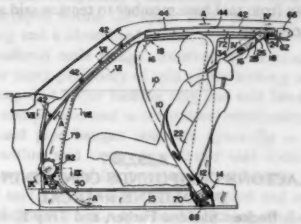
(f) the top flanges of all the elements being in planar alignment for the attachment of decking thereto.

4,232,885

PASSIVE SEATBELT SYSTEM

Ichiro Suzuki, Nagoya; Masanao Motonami, and Hisashi Ogawa, both of Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Mar. 6, 1979, Ser. No. 17,943
Claims priority, application Japan, Aug. 16, 1978, 53/112188
Int. Cl.[3] B60R *21/10*
U.S. Cl. 280—804 **8 Claims**



1. A passive seatbelt device which automatically fastens a restrictive belt about a seated passenger and releases it when the passenger gets in or out of the vehicle comprising:

a guide rail fastened to the roof side of a vehicle longitudinally along the body;

a movable truck, movable along the guide rail and to which is fastened an outer end of the passenger-restrictive belt;

a winding roller fastened at the center of the vehicle such that it winds up the inner end of said belt containing an emergency locking device which stops unwinding of the belt in a vehicular emergency;

a narrow belt fastened to one end of said truck;

a winding roller fastened onto a roof side of said vehicle rearwardly of said guide rail for winding up said narrow belt and containing means which stops the unwinding of the narrow belt in a vehicular emergency; and

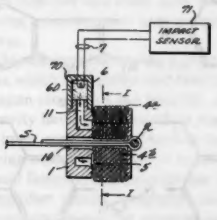
means for moving said truck towards the front of the vehicle when the passenger gets in or out of the vehicle, said means comprising a sliding block which engages with the truck from the rear of the vehicle whereby the truck may move separately from the sliding block towards the front of the vehicle and a means for moving said sliding block.

4,232,886

TENSIONING DEVICE FOR SEAT BELT

Noboru Tsuge, Kariya; Satosi Kuwakado, Aichi; Toshihiro Takei, and Toshiaki Shimogawa, both of Okazaki, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Mar. 13, 1979, Ser. No. 20,045
Claims priority, application Japan, Mar. 21, 1978, 53-32012
Int. Cl.[3] B60R *21/10*
U.S. Cl. 280—806 **9 Claims**



1. A tensioning device for a vehicle seat belt comprising:

a base member,

a movable plate member,

flexible bellow means, including at least one bellow shaped cylindrical body, connected between said base member and said plate member to form a sealed chamber therebetween, said bellow means being normally in a contracted state,

means for connecting one end of said seat belt through said base member to said plate member, and

gas supplying means for releasing high pressure gas into said sealed chamber to elongate said bellow means by said high gas pressure for moving said plate member in a direction away from said base member to tension said seat belt at an urgent time.

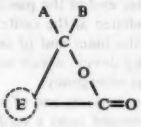
4,232,887

LACTONE COMPOUNDS CONTAINING AN INDOLIZINE RADICAL

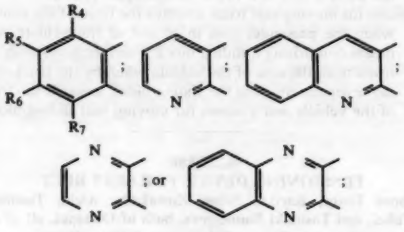
William J. Becker; Sheldon Farber, and Troy E. Hoover, all of Appleton, Wis., assignors to Appleton Papers Inc., Appleton, Wis.

Filed Mar. 5, 1979, Ser. No. 17,764
Int. Cl.³ B01M *5/16*
U.S. Cl. 282—27.5 **83 Claims**

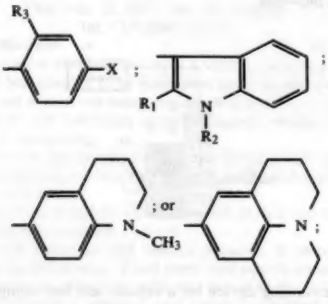
1. A compound represented by the formula:



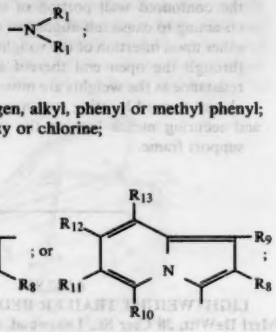
wherein E is:



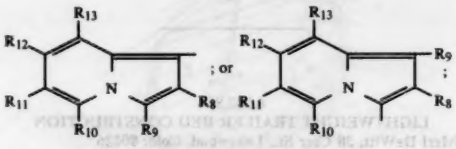
R_4, R_5, R_6 and R_7 are: hydrogen, chlorine or dialkylamino;
A is:



X is:



or morpholino;
R_1 and R_2 are: hydrogen, alkyl, phenyl or methyl phenyl;
R_3 is: hydrogen, alkoxy or chlorine;
B is:



R_8 is: phenyl, phenyl which is substituted by methoxy, phenyl, chloro or dimethylamino, naphthyl, pyridyl or alkyl;
R_9 is: hydrogen, alkyl or phenyl; and
R_{10}, R_{11}, R_{12} and R_{13} are: hydrogen or alkyl.

81. A pressure-sensitive record unit comprising:

(a) mark-forming components comprising at least one chromogenic compound according to claim 1 and an electron-accepting Lewis acid material reactive with the chromogenic compound;

(b) support web or sheet material; and

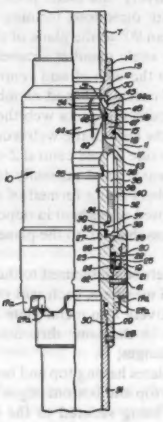
(c) a releasable liquid solvent for the mark-forming components arranged in continguous juxtaposition with the mark-forming components and supported by the sheet material, wherein the mark-forming components upon pressure release of the liquid solvent are brought into reactive contact in the released solvent.

4,232,888

WIRELINE RELEASABLE SEAL CONNECTOR FOR WELLPIPE STRINGS

Amareswar Amancharla, League City, Tex., assignor to Baker International Corporation, Orange, Calif.

Filed Jun. 19, 1978, Ser. No. 916,719
Int. Cl.³ E21B *17/046*
U.S. Cl. 285—18 **17 Claims**



1. A releasable connector for use in a well pipe string in a well bore comprising: an inner tubular body having lower means for connection with a downwardly extending pipe; an

outer tubular body telescopically engaged with said inner body and having upper means for connection with an upwardly extending pipe; releasable means for releasably securing said bodies to each other; first latch means releasably secured to said outer body; second latch means connected to said first latch means and releasably secured to said inner body; said releasable means being released in response to initial longitudinal movement of said outer body upwardly of said inner body to release said outer body from said first latch means; first holding means on said outer body extending under and engaging said second latch means to hold said second latch means secured to said inner body; downward movement of said outer body relative to said first and second latch means disengaging said outer body from said second latch means and reconnecting said first latch means to said outer body to permit release of said second latch means from said inner body and allow said outer body to be elevated from said inner body.

4,232,889

RECOCKABLE WELL HANGER

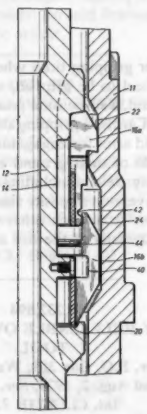
Samuel W. Putch, Houston, Tex., assignor to Norman A. Nelson, Houston, Tex., a part interest

Filed Jun. 6, 1978, Ser. No. 913,151

Claims priority, application United Kingdom, Jun. 16, 1977, 25322/77

Int. Cl.³ F16L *35/00*

U.S. Cl. 285—141 **1 Claim**



1. A pipe hanger assembly for vertically suspending an inner pipe from an outer pipe having a substantially constant diameter above a locking notch and a locating notch which pipe hanger assembly comprises:

(a) an elongated tubular hanger body for passing through said outer pipe connected to said inner pipe, defining an annular recess in its outer peripheral surface, having a stop shoulder at the upper end and at the lower end of said annular recess, having a locking surface in the upper portion of said annular recess, and having a holding shoulder located intermediate to the ends of said annular recess;

(b) a resiliently expandable and contractable cylindrical upper locking ring slideably positioned about said hanger body in the hanger body annular recess, said upper locking ring having a tapered shoulder at the top thereof for contacting said stop shoulder at the upper end of said hanger body annular recess, having a support surface for engaging said outer pipe locking notch, and having a chamfered outer top edge for disengaging from said locking notch and having an upper inner periphery for engaging said hanger body locking surface;

(c) a resiliently expandable and contractable cylindrical lower locking ring having a recess in its internal peripheral surface, and having chamfered top and bottom ends for engaging and disengaging said outer pipe locating notch, wherein said lower locking ring is mounted about said hanger body within said annular recess such that said hanger body holding shoulder engages said lower ring recess allowing lower locking ring transverse movement but not longitudinal movement and such that the upper portion of said lower ring is telescopically mounted about the lower portion of said upper ring; and

(d) detent means comprising a chamfered male flange transversely arrayed within the upper inner periphery of said lower ring and a chamfered female groove, for receiving said chamfered male flange, transversely arrayed about the lower outer periphery of said upper locking ring, for maintaining said upper locking ring and said lower locking ring compressed and in telescoped relationship while passing said pipe hanger assembly upwardly or downwardly within said outer pipe above said locking and locating notches, and for maintaining said upper locking ring and said lower locking ring expanded and in disengaged relationship upon said lower locking ring encountering said locating notch.

4,232,890

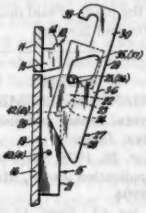
FASTENER WITH CAMMING HANDLE

Cuyler Hoen, Rennesselaer, N.Y., assignor to Simmons Fastener Corporation, Albany, N.Y.

Filed Mar. 9, 1979, Ser. No. 19,280

Int. Cl.³ E05C *5/02*

U.S. Cl. 292—114 **9 Claims**



1. A fastener for removably attaching a first panel to a second panel comprising

a strike member adapted to be secured to said first panel and having a protrusion means;

a plastic resin fastener body member having a body portion with an outer area to be secured to said second panel and an inner area opposite said outer area and having a raised portion having a slanting cam area merging thereto and a cut-back area;

a plastic resin handle member having a gripping portion with an inner area which lies against said fastener body member inner area upon closure of the fastener, a central portion forming a cavity having a cam surface joining its rear wall and its said inner area, said cam surface riding on said cam area and being removably secured in said cut-back upon closure of said fastener, and an extension portion having a hook-like member which removably catches said strike member protrusion means for closing said fastener; and

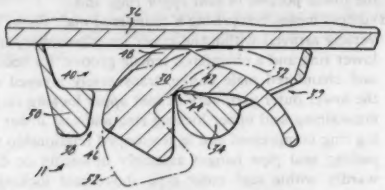
means connecting said handle member and said fastener body member to permit rotational movement of said handle member and its movement toward and away from said strike member.

4,232,891

DOOR HARDWARE WITH POSITIVE TORQUE

Stephen J. Ringe, Detroit, Mich., assignor to Fruehauf Corporation, Detroit, Mich.

Filed May 30, 1978, Ser. No. 910,493
Int. Cl.[3] E05C 3/04
U.S. Cl. 292—218 5 Claims



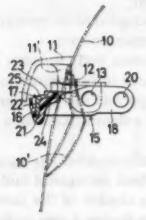
1. A door for a shipping container comprising; a hinge pivotally supporting said door at one edge of an opening to said container, a cam rod supported for rotation on and relative to said door at an edge of the door opposite to the hinged edge thereof, a cam finger having a free end and a supported end mounted on one end of said rod, a housing secured to said container having a cam surface engagable by said cam finger for camming the door to a closed position, means for rotating said rod, and cam finger relative to said housing, said cam finger having a first substantially planar surface when said door is in the closed condition, the point of contact between the cam surface on said housing and said planar surface of said cam finger lying in a plane which is spaced to the opposite side of the axis of rotation of said cam rod from the projecting end of said finger, whereby the vector of the reaction force of said cam surface on said cam finger results in a moment on said rod in a latching direction due to an opening force on said door independent of movement of said cam rod and cam finger in a direction parallel to the plane of said door opening and relative to the cam surface on said housing.

4,232,892

OUTSIDE DOOR HANDLE ASSEMBLY FOR VEHICLES

Nobuyuki Kuki, Toyota, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Apr. 20, 1978, Ser. No. 898,041
Claims priority, application Japan, Mar. 31, 1977, 52-39902; Mar. 31, 1977, 52-39904
Int. Cl.[2] E05C 13/00
U.S. Cl. 292—347 4 Claims



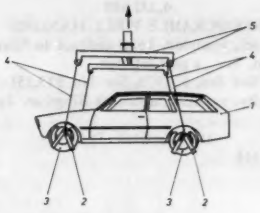
1. An outside door handle assembly for vehicles comprising, a handle case having means for securing said case to an outer panel of a vehicle door and a handle member including a handle operating portion made of plastics and an arm portion made of metal connected to said handle operating portion and rotatably supported on said handle case, said handle operating portion of said handle member being provided with a groove and boss means and said arm portion of said handle member being provided with two leg portions rotatably supported to said handle case, a bent portion having a connection portion inserted into said groove of said handle operating portion and a securing portion for receiving and securing said boss means of said handle operating portion.

4,232,893

DEVICE FOR GRIPPING TIRED WHEELS OF A VEHICLE

Joachim Kijewski, Bad Oeynhausen-Rehme, Fed. Rep. of Germany, assignor to Auto-Weber GmbH & Co. KG, Minden, Fed. Rep. of Germany

Filed Jul. 21, 1978, Ser. No. 926,969
Claims priority, application Fed. Rep. of Germany, Jul. 23, 1977, 2733406
Int. Cl.[3] B66C 1/20
U.S. Cl. 294—82 AH 10 Claims



1. A device for gripping tired wheels of a vehicle comprising, for each wheel to be gripped, a pair of arms articulated together at one end, a suspension point provided at said articulated ends of said arms, a gripping device located at the other end of each of said arms for engagement with the tread of a tire on each axial side of their ground engagement portions, and each said gripping device including a pair of gripping limbs disposed respectively on opposite sides of the tire and movable towards and away from each other for gripping engagement with opposite sidewalls of the tire and disengagement therefrom.

4,232,894

SELECTIVELY RELEASABLE OVERSHOT AND PULL TOOL

William T. Taylor, P.O. Box 309, Warren, Tex. 77664

Filed Aug. 2, 1979, Ser. No. 62,912
Int. Cl.[3] E21B 31/12
U.S. Cl. 294—86.21 18 Claims

1. A tool used to retrieve an article in a well bore, comprising:

a first assembly adapted to be connected to apparatus extending down in to the bore, said first assembly including:

a pin extending radially of the bore;

a shoulder for butting against the article to limit movement of said first assembly toward the article; and

caged fingers with each finger having an end movable to a position for engaging the article;

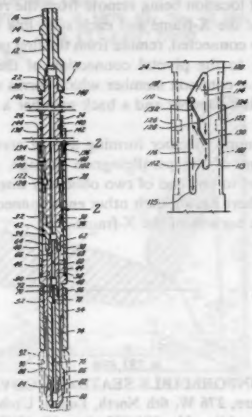
a second assembly movably mounted with said first assembly for moving the fingers into the engaging position, said second assembly including:

a body having a cavity with two grooves of unequal length extending axially of the bore, the pin of said first assembly being disposed within the cavity for moving within the grooves;

a spring mounted with the body for moving the pin from alignment with the shorter groove to alignment with the longer groove when said second assembly is moved relative to the first assembly;

an annular shoulder sloping radially of the well bore for moving the ends of the fingers into the engaging position as the pin moves in the longer groove; and

means mounted with said first assembly for urging said second assembly axially of the well bore, said urging means moving the annular shoulder of said second assembly toward the caged fingers of said first assembly for moving each end of the fingers radially into the engaging position after the shoulder on said first assembly limits its movement toward the article.

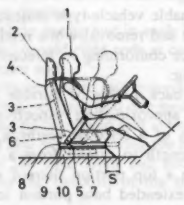


4,232,895

IMPACT ABSORBING DEVICE FOR PROTECTING VEHICLE'S OCCUPANT FROM IMPACT CAUSED BY COLLISION

Komaki Yoshio, Hadano; Fukuda Shigehisa; Fukuda Tsuguhiro, both of Uenomuro; Nakao Noriaki, Mito; Suzuki Katsuhide, and Ishizuka Matsuo, both of Yatabe, all of Japan, assignors to Japan Automobile Research Institute, Inc., Japan

Filed Jul. 11, 1977, Ser. No. 814,615
Int. Cl.[2] B60N *01/02*
U.S. Cl. 296—65 A **6 Claims**



1. In a vehicle seat structure including a seat mounting having a first portion for securing to the vehicle, and a second portion to which a seat may be secured, said second portion being relatively movable with respect to said first portion along the direction of movement of the vehicle, the improvement which comprises:

(i) said second portion is engaged with said first portion for said relative movement so as to be guided thereby along the direction of movement

(ii) a plastically deformable deformation member is secured to one of said first and second seat

(iii) die means are secured to the other of said first and second seat mounting portions,

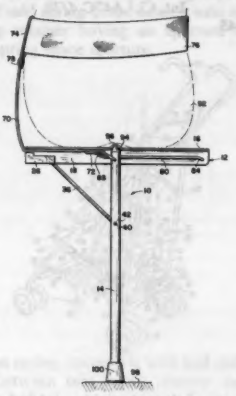
said deformation member and said die means being positioned for engagement one with the other such that, when said second portion moves with respect to said first portion, said die means progressively deforms said deformation member for the absorbtion of kinetic energy resulting from deceleration of the seat structure.

4,232,896

PORTABLE AND COLLAPSIBLE SEAT

Lloyd Caldwell, Choteau, Okla., assignor to Lloyd Caldwell, Choteau, Okla.

Filed Aug. 6, 1979, Ser. No. 63,990
Int. Cl.[3] A47C *1/00*
U.S. Cl. 297—4 **4 Claims**



1. A portable and collapsible seat adapted to be suspended from the belt of a user comprising a substantially flat and elongated base in the shape of a rectangle formed by a pair of relatively long parallel side edges connected at their ends to a pair of relatively short parallel end edges perpendicular to the long edges, a pair of elongated flanges extending outwardly from one side of said base at right angles thereto and along the long side edges thereof, a leg extending from a first end thereof to a second end thereof and having a length greater than the length of said base, a V-shaped link having a flattened portion adjacent its center and being curved at its ends, the flattened portion of said link being received in a hole said leg intermediate the ends thereof, the curved ends of said link being received in openings in said elongated flanges adjacent one end of said base, said flanges being provided with extensions at said one end of said base being bent inwardly away from said one end and towards the longitudinal center of said base to provide a clamp for the first end of said leg when said leg is positioned to lie against said base, a clip pivotally connected to said leg adjacent said second end of said leg, said clip having a pair of arms extending outwardly at right angles to said leg on opposite sides thereof and for a distance slightly less than the width of said base, a flexible strap having a width slightly less than the width of said base and having one end connected to the arms of said clip, said belt extending from said one end thereof along the surface of said base between the said leg and said base and terminating at an end opposite from one said end thereof in a loop adapted to be received on said belt of said user, said clip and said one end of said strap lying closely adjacent the end of said base opposite from said one end thereof when said leg is positioned to lie against said base, a pair of flat strips extending inwardly towards each other at right angles to said flanges and overlying said strap in parallel relation to said base so as to form a track for said clip and said one end of said belt when said leg is pivoted outwardly away from said base, whereby, said first end of said leg is first pivoted away from said one end of said base and out of said clamp and, whereby subsequent movement of said strap and said clip in a direction from the opposite end of said base towards said one end thereof will cause said leg to pivot around said link relative to said base until said leg is substantially perpendicular to said base.

4,232,897

LIE BACK BUGGY

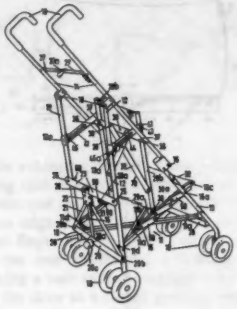
Owen F. Maclaren, deceased, late of Barby, England; by William L. Barber, executor, Rugby, and by Marie I. Maclaren, executor, Barby, both of England, assignors to Andrews Maclaren Ltd., England

Filed Jul. 6, 1978, Ser. No. 922,439

Claims priority, application United Kingdom, Jul. 7, 1977, 28599/77; Feb. 17, 1978, 6424/78; Aug. 26, 1978, 35902/78

Int. Cl.[3] A47C *4/30*

U.S. Cl. 297—45 7 Claims



1. A chair frame of elongate rigid members which are interpivoted and foldable into a compact bundle in which the rigid members extend substantially parallel to each other, the chair frame comprising:

(a) two base members which are pivotally interconnected to form a laterally collapsible X-frame in which the opposite ends of the two base members provide front and back corners of the X-frame;

(b) two back members which are disposed on coplanar axes and respectively extend upwardly from pivotal connections at the back corner of the X-frame;

(c) two lower brace members respectively pivoted, at their lower ends, to the front corners of the X-frame;

(d) two upper brace members respectively pivoted, at their upper ends, to the upper ends of the back members;

(e) two knuckle joints respectively connecting the two lower brace members to the two upper brace members so as to prevent folding of the back members towards the X-frame when the chair frame is extended with the lower brace members respectively extending substantially colinearly with the upper brace members and the front or rear corners of the X-frame are held apart, but to allow the knuckle joints to move towards the back corners of the X-frame, thus permitting folding of the back members towards the X-frame when the back corners of the X-frame are allowed to move towards each other;

(f) two seat support members respectively pivoted to the chair frame at or adjacent the back corners of the X-frame and respectively pivoted to the lower brace members between the knuckle joints and the front corners of the X-frame;

(g) two upwardly extending back rest members which are disposed on coplanar axes and form part of a laterally collapsible back rest, respectively supported on the two seat support members and respectively mounted for pivotal movement so that the upper ends of the back rest members are movable between upper and lower positions;

(h) a laterally collapsible bracing frame which can be locked to hold the back corners of the X-frame apart and is located adjacent the X-frame so that the back rest members can be moved between their upper and lower positions without being obstructed by the collapsible bracing frame;

(i) the laterally collapsible bracing frame comprising two locking struts interconnected by a pivot and respectively pivotally connected at opposite ends to the back corners of the X-frame, two link members, each such link member being supported on a respective first pivot at one end of the link at a fixed location on a respective back member, the fixed location being remote from the respective back corner of the X-frame and each such link member being pivotally connected, remote from the first pivot of the link member, to the pivotal connection of the two locking struts by a common member which forms with a locking strut, a link member and a back member a parallelogram linkage;

(j) the common member forming a slide arranged to limit movement of the parallelogram linkage, and pivotally connected to one end of two obliquely disposed supporting members having their other ends connected to respective back corners of the X-frame.

4,232,898

CONFORMABLE SEATBACK COVER

Alberta Bodrero, 276 W. 6th North, Logan, Utah 84321

Continuation of Ser. No. 806,178, Jun. 13, 1977, abandoned. This application Aug. 17, 1978, Ser. No. 934,413

Int. Cl.[3] A47C *31/10*

U.S. Cl. 297—219 3 Claims

1. A conformable vehicle-type seatback cover adapted for easy installment and removal while retaining a professionally fitted appearance conforming to selected seatback configurations, comprising:

a. front and back panels of durable fabric having width dimensions approximating respective front and back surface widths of a selected seatback, said panels having sufficient length to extend from a base portion of said seatback to a top portion thereof with the front panel having an extended base portion to facilitate threading thereof under the seatback for attachment to the back panel;

b. narrow side panels having width dimensions moderately less than the corresponding thickness of said seatback and constructed of a stretchable fabric, said side panels being attached at lateral edges thereof to corresponding lateral edges of said respective front and back panels, said combination of front, back and side panels forming a covering structure substantially preconformed to said seatback configurations;

c. a top panel having dimensions sufficient to join the top edges of said front, back and side panels; and

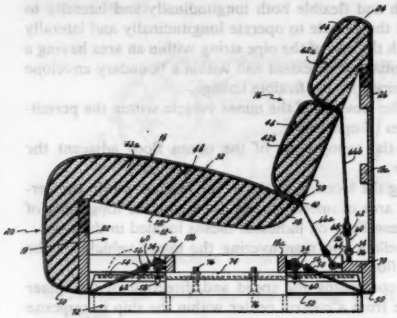
d. nonfraying, decorative, leather-like reinforcing material affixed over said top panel to inhibit fraying of the top panel when openings are made therein for accommodating headrests or similar seatback accessories and to enhance the appearance of the cover, the reinforcing material being stitched to the top panel with the stitching defining a central section in which openings may be made.

4,232,899

SEATING UNIT AND METHOD OF CONSTRUCTION

Lee H. Fister, Jr., Centerville, Ohio, assignor to August Incorporated, Centerville, Ohio

Filed Jun. 4, 1979, Ser. No. 45,194
Int. Cl.[3] A47C 27/00
U.S. Cl. 297—229 6 Claims



1. A seating unit comprising,
a rigid chair frame having a front, a back, sides, and an occupant seating area having a seat and a back portion,
rigid transverse cross members extending between said sides and attached securely thereto,
a rigid back transverse member extending between said sides and attached securely thereto at the back of said frame,
webbing strips extending between said sides in the area of the occupant seating area,
a one-piece upholstery cover adapted to overlie the occupant seating area of said frame,
said cover having a top side with a seat and back portion for occupant seating overlying the seating area of the frame, said seat and back portion of said cover having an underside,
at least one fabric casing attached to the underside of said back portion, said cover having a bottom portion having side, front and back sides, each side having fabric pockets at their lowermost portion,
rigid rods in each fabric casing and in each fabric pocket,
clip means connected to said rigid rods at one end and having clips at the other end,
a plurality of eyebolts secured to said transverse cross members and to said back member, said clip means securing the rigid rods in the fabric casings to said eyebolts in the back member, and said clip means securing the rigid rods in the fabric pockets of the side, front and back sides of the bottom portion to the eyebolts in the transverse cross members.

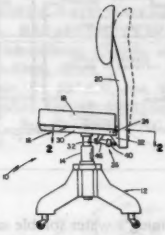
4,232,900

CHAIR CONTROL

James A. Parker, Orange, Mass., assignor to Collier-Keyworth Company, Gardner, Mass.

Filed Mar. 26, 1979, Ser. No. 24,402
Int. Cl.[2] A47C 7/40
U.S. Cl. 297—305 5 Claims

1. In a chair having a base, a vertical post supported by said base, a frame rotatable with respect to said base, a chair seat mounted on said frame, and a chair back resiliently and pivotably connected to said frame for tilt and return of said chair back to a rest position,
a chair control for adjustment of said chair back rest position and adjustment of the degree of resiliency of said connection, said control comprising
a rod support unit comprising a spring brace mounted on said frame beneath said seat and providing an aperture,
a rod assembly connected to said chair back at a universal joint and having its remote end extending through said aperture, said rod assembly being slidable through said aperture,
a spring tension handwheel concentric with said rod assembly and disposed between said rod support unit and said universal joint, said spring tension handwheel being internally threaded for axially adjustable connection to said rod assembly,
said rod support unit further comprising a spring retainer on the face of said spring brace nearest said universal joint, said spring retainer having an aperture corresponding with said spring brace aperture,



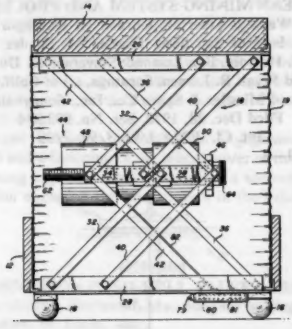
a compression spring concentric with said rod assembly and confined between said spring retainer and said spring tension handwheel,
said chair control further comprising
rod assembly front travel stop means adjacent said rod assembly remote end and engageable with said rod support unit, and
chair back rest position control means connected to said rod assembly for adjusting the distance between said front travel stop means and said universal joint.

4,232,901

ADJUSTABLE OTTOMAN

Elaine M. Harrington, 708 44th St., Des Moines, Iowa 50312, and Paul C. Menning, 1624 E. 24th St., Des Moines, Iowa 50317

Filed Oct. 12, 1979, Ser. No. 84,316
Int. Cl.[3] A47C 9/12, 25/00
U.S. Cl. 297—439 8 Claims



1. An adjustable foot rest comprising a base, elevating mechanism housed within said base, said elevating mechanism including an electric motor, a cushion supported on said elevating means and switch means for actuating said electric motor to raise and lower said cushion, said elevating mechanism comprising a pair of spaced apart lazy-tong assemblies and said electric motor being supported solely by a member extending between said spaced apart lazy-tong assemblies so that said

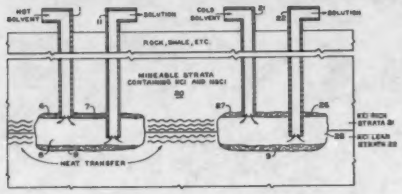
electrical motor is adapted to move both vertically and horizontally.

4,232,902

SOLUTION MINING WATER SOLUBLE SALTS AT HIGH TEMPERATURES

Ephraim A. Cuevas, Corpus Christi, Tex., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Feb. 9, 1979, Ser. No. 10,563
Int. Cl.[2] E21C *41/08*
U.S. Cl. 299—4 **26 Claims**



1. A method of mining a water soluble salt from a subterranean formation containing a water soluble salt deposit comprising:

(1) feeding into the deposit through a bore hole in communication therewith a first aqueous solvent at a temperature above the deposit temperature to heat the deposit substantially above its natural temperature and dissolve salt from the deposit;

(2) withdrawing from the deposit first solvent enriched in salt;

(3) feeding into the deposit through a bore hole in communication therewith a second aqueous solvent at a temperature lower than the temperature of the first solvent, thereby dissolving a substantially increased amount of salt in excess of the amount of salt that would be dissolved by the second solvent in the absence of the increased deposit temperature and thereby recapturing heat from the deposit by the second solvent; and

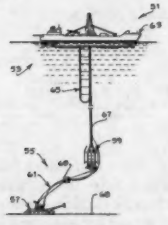
(4) withdrawing from the deposit the second solvent enriched in salt.

4,232,903

OCEAN MINING SYSTEM AND PROCESS

Conrad G. Welling, Atherton; Gordon H. Davenport; Guenter Reichert, both of San Jose; Charles M. Snyder, Saratoga; Milton C. Harrold, Ben Lomond; Salvatore H. Donze, Santa Clara, and Frank R. Larsen, Saratoga, all of Calif., assignors to Lockheed Missiles & Space Co., Inc., Sunnyvale, Calif.

Filed Dec. 28, 1978, Ser. No. 973,854
Int. Cl.[3] E02F *3/92, 3/94, 7/00*
U.S. Cl. 299—8 **99 Claims**



1. A method of mining manganese nodules from the ocean floor and lifting the nodules to a surface ship and comprising,

extending a relatively rigid pipe string downwardly from the surface ship until the lower end of the pipe string is positioned a relatively short distance above the ocean floor,

placing a self-propelled, maneuverable, miner vehicle having a nodule pick-up mechanism on the ocean floor,

connecting the miner vehicle to the lower end of the pipe string by a flexible linkage comprising power, data and control lines for the miner vehicle and which is long enough and flexible both longitudinally and laterally to permit the vehicle to operate longitudinally and laterally beneath the end of the pipe string within an area having a substantial lateral extent and within a boundary envelope determined by the flexible linkage,

sensing the location of the miner vehicle within the permitted area of operation.

viewing the topography of the ocean floor adjacent the vehicle,

indicating the location of the miner vehicle within the permitted area of operation and displaying the topgraphy of the ocean floor on indicator means located in the ship,

self-propelling and maneuvering the miner vehicle on the ocean floor,

actively controlling the speed and direction of the miner vehicle from a control center within the ship in response to the information indicated by the indicator means, and

coordinating the movement of the ship with the movement of the vehicle to cause the ship and pipe string to follow the motion of the miner vehicle and to move the area of permitted operating along with and in the direction of movement of the miner vehicle as required to retain the miner vehicle in said boundary envelope.

4,232,904

METHOD AND APPARATUS FOR DEEP MINING USING CHAIN DRIVEN IN FIXED DIRECTION

Robert L. Hurd, 2063 Manor Dr., Lexington, Ky. 40502

Filed Feb. 21, 1979, Ser. No. 13,749
Int. Cl.[3] E21C *29/14, 41/04*
U.S. Cl. 299—18 **11 Claims**

1. The method of removing a first solid material from a second solid material when the first material is embedded in the second material in layers, said method comprising the steps of:

surrounding the portion of said first solid material which is to be removed by a driving chain having spaced therealong cutting surfaces,

rotating said driving chain and cutting surfaces around said first material in a fixed direction, and

applying continuous outward pressure on said driving chain so as to maintain said cutting surfaces in contact with said first material at a location substantially opposite from the location from which said pressure is applied, said pressure being applied with a force sufficient to cause said cutting surfaces to dislodge said contacted first material.

4,232,905

TUNNELLING MACHINE

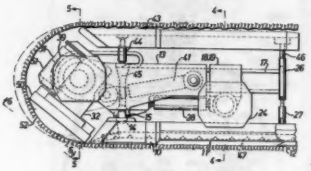
Helmut Dick, Spiez, Switzerland, assignor to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Mar. 30, 1979, Ser. No. 25,549

Claims priority, application United Kingdom, Apr. 4, 1978, 13172/78

Int. Cl.³ E21D *9/10*

U.S. Cl. 299—31 **10 Claims**



1. A tunnelling machine comprising:

a frame (12, 13),

means (20–25, 35–40) for immobilizing the frame in the tunnel,

a swingable unit (31) carried by said frame to be swingable about a horizontal first axis (I) that is transverse to the machine and motor means (41) for swinging said swingable unit about said first axis (I),

said swingable unit comprising a housing (32), a head (50) rotatably mounted in the housing to be rotatable about a second axis (II) that is transverse to said first axis (I), motor means (51) for rotating the head, and a plurality of free rolling cutters (53–58) mounted on the head in a convex arrangement to form a convex front face of the head,

said second axis (II) passing said first axis (I) at a distance and on the trailing side with respect to the head so as to cause the cutters to cut both when they are on the leading side of the head and when they are on the trailing side of the head upon simultaneous rotation of the head and swinging of the swingable unit in a working swing stroke while the frame is fixed in the tunnel by said immobilizing means so as to hold the first axis (I) fixed.

4,232,906

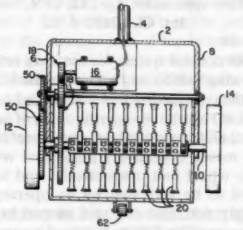
MACHINE FOR STRIPPING SHINGLES

Dale A. Torbenson, Hensel, N. Dak. 58241

Filed Apr. 2, 1979, Ser. No. 26,331

Int. Cl.³ E04D *15/00*

U.S. Cl. 299—39 **7 Claims**



1. A machine for stripping shingles from a surface, said machine comprising a frame having a handle portion and first and second leg portions, an axle mounted on said leg portions and extending therebetween, a portion of said axle between said leg portions being rectangular in cross-section configuration, first and second wheels mounted on said axle, motor means mounted on said frame, drive means interconnecting said motor means and said axle, and cutter assemblies fixed to said axle, each of said cutter assemblies comprising a base block portion comprising a flat plate adjacent and fixed to a flat surface of said axle, a coil spring portion connected to said base portion and extending outwardly therefrom, and a cutter portion connected to said spring portion and extending outwardly therefrom, whereby operation of said motor causes rotation of said axle and thereby rotative movement of said cutter assemblies, said cutter assemblies being further caused to move radially in response to centrifugal and counterforces of and acting upon said coil spring portion.

4,232,907

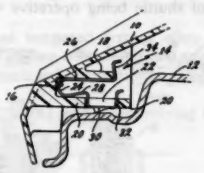
VEHICLE WHEEL WITH WHEEL COVER AND RETAINING CLIP

Hans R. Beisch, Amherstburg, Canada, assignor to Norris Industries, Inc., Ypsilanti, Mich.

Continuation of Ser. No. 807,572, Jun. 17, 1977, abandoned. This application Apr. 19, 1979, Ser. No. 31,376

Int. Cl.³ B60B *7/00*

U.S. Cl. 301—37 R **40 Claims**



1. In combination for covering at least a portion of the outer face of a wheel, including,

a wheel cover including a plurality of recesses,

each recess being defined by at least a pair of oppositely disposed spaced wall portions on the wheel cover, each of the wall portions defining an interruption,

a plurality of spring clips each having a pair of resilient leg portions positioned within an individual one of the recesses and disposed against individual ones of the wall portions of such individual recess,

each spring clip normally having a spacing between the resilient leg portions greater than the spacing between the wall portions of each recess and the resilient leg portions of each spring clip, when positioned within each recess, being preloaded by the restraint of the wall portions, and

each spring clip additionally including a first flanged extension of a particular one of the leg portions outside of the associated recess, at a position engaging the interruption defined by a particular wall portion, to be constrained by the interruption,

the flanged extension providing an engagement with the wheel and a fastening of the wheel cover to the wheel, and

each spring clip additionally including a second flange at a position engaging the interruption in the other wall portion.

4,232,908

COMBINATION PUSH-PULL VALVE ASSEMBLY

George W. Stearns, Florissant, Mo., assignor to Wagner Electric Corporation, St. Louis, Mo.

Filed Feb. 7, 1978, Ser. No. 875,807

Int. Cl.³ B60T *13/00*

U.S. Cl. 303—9 **28 Claims**

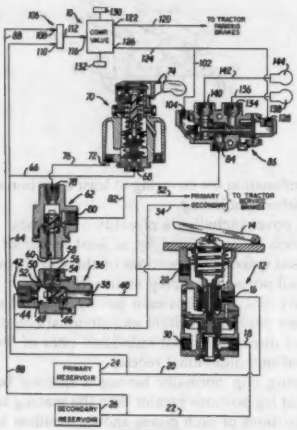
1. A combination control valve comprising:

(a) a body;

(b) an air inlet into said body;

(c) a first manual push-pull control valve in said body connected between said air inlet and a first outlet;

(d) said first manual push-pull valve having first and second selectable positions;
(e) first valve means in said first manual push-pull control valve for connecting air pressure from said air inlet to said first outlet when said first manual push-pull control valve is in its first position and for blocking the flow of air pressure from said air inlet to said first outlet when in its second position;
(f) said first valve means being further operative to vent air pressure from said first outlet when said first manual push-pull control valve is in its second position;
(g) a second manual push-pull control valve having first and second selectable positions in said body connected to a second outlet;
(h) an emergency valve connected to said air inlet;
(i) a first passage for admitting air pressure to said second manual push-pull control valve;
(j) a pressure-responsive control shuttle reciprocatably disposed in said body;
(k) a second passage for admitting air pressure to said control shuttle;
(l) resilient means for biasing said control shuttle into a first position;
(m) said control shuttle being operative when in its first



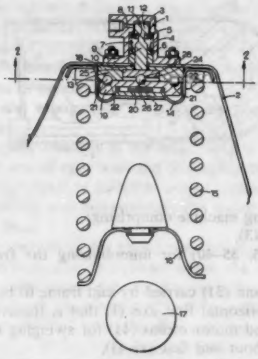
position to oppose said second manual push-pull control valve from being placed in its second position;
(n) a third passage connecting air pressure from said first outlet to said control shuttle;
(o) air pressure responsive means on said control shuttle responsive to air pressure exceeding a predetermined value to displace said control shuttle to a second position wherein it does not oppose said second manual push-pull control valve being in its second position;
(p) said emergency valve being displaceable from a first position to a second position by air pressure at said air inlet exceeding a second predetermined value;
(q) means on said emergency valve for blocking at least said second passage when said emergency valve is in its first position;
(r) said second passage being connected to said first outlet; and
(s) said second manual push-pull control valve having seal means for blocking said first passage and preventing the connection of air pressure to said second outlet and for venting air pressure at said second outlet when said second manual push-pull control valve is in its first position, and for providing air pressure communication between said first passage and said second outlet when said second manual push-pull control valve is in its second position.

4,232,909

VEHICLE LOAD SENSING ASSEMBLIES

Glyn P. R. Farr, Leek Wootton, England, assignor to Girling Limited, Birmingham, England

Filed May 19, 1978, Ser. No. 907,583
Claims priority, application United Kingdom, May 19, 1977, 21204/77
Int. Cl.[3] B60T *8/18*
U.S. Cl. 303—22 R **6 Claims**



1. A vehicle load-sensing assembly for use with a vehicle fluid-pressure braking system comprising an input member subjected to a force in a road spring, a valve having a movable valve member for controlling the flow of fluid through said valve, and a thrust transmitting mechanism located between said input member and said valve member, wherein said thrust transmitting mechanism comprises a rotary operating plate acting on said input member, a relatively fixed reaction plate, camming means disposed between said operating plate and said reaction plate for translating axial movement of said input member into rotary movement of said operating plate and vice versa, and transmission means for transmitting rotary movement of said operating plate to said valve member to regulate the flow of fluid through said valve.

4,232,910

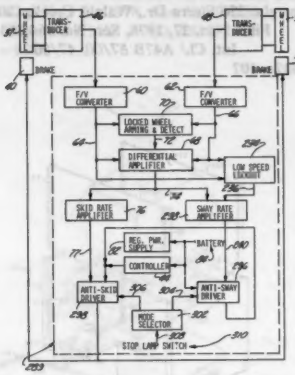
SYSTEMS AND METHODS FOR CONTROLLING TRAILER BRAKES AS A FUNCTION OF TRAILER WHEEL ROTATION

Robert C. Snyder, Country Club Hills, Ill., assignor to Motor Wheel Corporation, Lansing, Mich.

Continuation-in-part of Ser. No. 472,644, May 23, 1974, abandoned. This application Apr. 12, 1976, Ser. No. 676,010
Int. Cl.[2] B60T *8/10*
U.S. Cl. 303—96 **86 Claims**

61. In a brake control system for use in an articulated system including a towing vehicle and a towed vehicle such as a trailer or the like of the type having first and second nondriven wheel units disposed at respective opposite sides of said towed vehicle, each wheel unit having at least one wheel therein, first and second brake means operatively associated with at least one wheel in each wheel unit, respectively, and brake activating means adapted to be activated by an operator of a towing vehicle to apply said first and said second brake means, the combination comprising first and second means for generating respective first and second signals which vary proportionally to the angular velocity of at least one wheel in each of said wheel units, respectively, means for comparing said first and second signals to each other and providing a differential signal representing a difference between said first and second signals, and means operatively coupled to said brake activating means and responsive to said differential signal for simultaneously regulating brake application by said first and said second brake

means at one wheel in each wheel unit proportionally to said differential signal such that a change in wheel speed differential between one wheel in one unit and one wheel in the other unit causes a corresponding change in brake regulation.



4,232,911

CARRIAGE WITH ARTICULATED TRACK

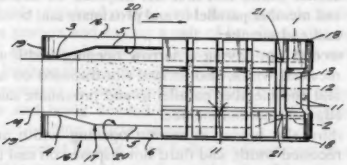
Alfred A. M. Valantin, Clermont, France, assignor to Charbonnages de France, Paris, France

Continuation of Ser. No. 858,065, Dec. 6, 1977, abandoned. This application May 24, 1979, Ser. No. 42,136

Claims priority, application France, Dec. 7, 1976, 76 36768

Int. Cl.³ B22D *55/10, 55/20*

U.S. Cl. 305—16 **7 Claims**



1. A carriage for a machine, such as a roof support, comprising:

a beam having rounded ends; and

an articulated track encircling the beam,

said articulated track being guided by friction in a guide path formed around the beam, which guide path has lateral clearance on the straight part of the beam and guides the track without play around the rounded ends of the beam;

the guide path on the straight part of the beam being formed with said lateral clearance on either side of at least one and at most two narrowed regions where there is localised reduction of lateral play of the track in the guide path.

4,232,912

EARTH BORING BIT WITH GRIDDED FERROUS BEARING SURFACE

Robert L. Williamson, Fort Worth, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Dec. 11, 1978, Ser. No. 968,647

Int. Cl.³ F16C *33/24*

U.S. Cl. 308—8.2 **4 Claims**

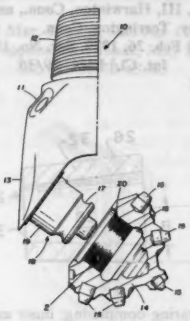
1. A rolling cone cutter earth boring bit, comprising:

a bit body, said bit body having at least one downwardly extending arm;

a cantilevered bearing pin of ferrous alloy extending from said arm;

a rolling cone cutter of ferrous alloy adapted to be rotatably mounted on said bearing pin;

bearing and cutter retaining means between said bearing pin and said cone cutter;



a quenched and tempered ferrous alloy bearing surface between said rolling cone cutter and said bearing pin;

a quantity of knurls and indentations on said bearing surface; and

a layer of anti-galling material overlying said bearing surface.

4,232,913

RESTRICTOR FOR A BEARING POCKET IN A HYDROSTATIC BEARING

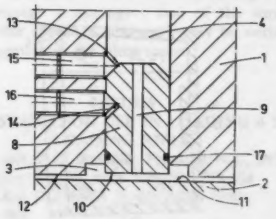
Bengt Nilsson, Lidköping, Sweden, assignor to Lidkopings Mekaniska Verkstads AB, Lipkoping, Sweden

Continuation of Ser. No. 721,876, Sep. 9, 1976, abandoned. This application Nov. 20, 1978, Ser. No. 962,225

Claims priority, application Sweden, Oct. 9, 1975, 7511301

Int. Cl.³ F16C *32/06*

U.S. Cl. 308—9 **5 Claims**



1. In an assembly comprising at least first and second movable machine elements having confronting first and second hydrostatic bearing surfaces, means defining a channel in said first machine element, at least one bearing pocket surrounding said channel at the end thereof adjacent said second bearing surface, a member mounted in said channel having an axial end face parallel to said second bearing surface defining therebetween a slot restrictor, said member having a through port to convey pressure medium from said channel directly to said slot restrictor inboard of said bearing pocket, means mounting said member for depthwise adjustment in said channel between an upper limit position and a lower limit position wherein the space between said axial end face and said second bearing surface is greater than the space between the said first and second bearing surfaces, actuation of said member in said channel between said limit positions selectively varying pressure in the bearing pocket from a constant pressure source and

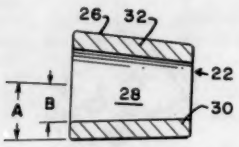
in turn varying the space between said first and second bearing surfaces.

4,232,914

HOLLOW ROLLER TAPERED BEARING

Willard L. Bowen, III, Harwinton, Conn., assignor to The Torrington Company, Torrington, Conn.

Filed Feb. 26, 1979, Ser. No. 15,010
Int. Cl.³ F16C *19/36*
U.S. Cl. 308—215 **11 Claims**



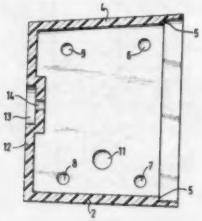
1. A tapered bearing comprising: inner and outer members having inner and outer tapered raceways confronting one another to define an annular space; and a plurality of hollow rollers located in said annular space, each hollow roller having an axial bore extending completely therethrough, the ratio of the diameter of the axial bore to the outside diameter of each hollow roller being uniform for its full length.

4,232,915

CONSOLE FOR HOLDING NAUTICAL INDICATORS

Joachim Hahn, Oberursel, Fed. Rep. of Germany, assignor to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed May 4, 1978, Ser. No. 902,702
Claims priority, application Fed. Rep. of Germany, May 9, 1977, 2720764
Int. Cl.² A47B *87/00*; H01H *9/02*
U.S. Cl. 312—107 **9 Claims**



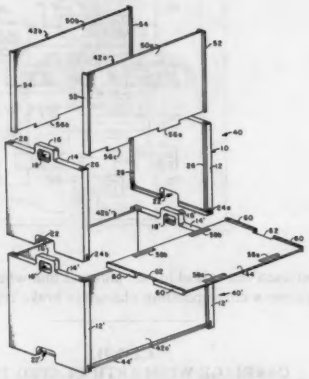
1. A console for holding nautical indicators, comprising:
a one-piece molded plastic housing having integral side walls, a back wall, a bottom wall, a top wall and an open front for receiving and holding an indicator, said console being dimensioned to hold only a single indicator with a front frame thereof covering the open front of the console;
said side walls including a pair of spaced apart, generally parallel side walls each having an opening therein in like positions in the respective walls; and
said openings being covered by a frangible membrane comprising a thin spayed-on-skin, whereby a plurality of said consoles may be placed side-by-side, with the membranes covering the openings in adjacent side walls of adjacent consoles pierced for receiving fasteners through the respective openings to secure the single consoles together to form a combination console.

4,232,916

DEMOUNTABLE AND STACKABLE MULTIPURPOSE CONTAINER

Daniel Correia, 226 Sierra Dr., Walnut Creek, Calif. 94596

Filed Nov. 27, 1978, Ser. No. 964,263
Int. Cl.³ A47B *87/00, 47/00*
U.S. Cl. 312—107 **1 Claim**



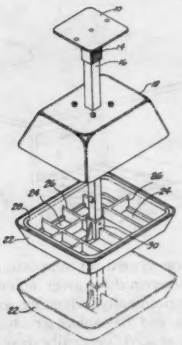
1. A multipurpose container comprising
a pair of end members having a face, a top edge, a first side, a second side and a bottom edge,
a first slot having a narrow opening width and a wide recessed width, said first slot disposed on said face of said end member parallel to and proximate said bottom edge of said end member,
a second slot having a narrow opening width and a wide recessed width, said second slot disposed on said face of said end member parallel to and proximate said first side edge of said end member,
a third slot having a narrow opening width and a wide recessed width, said third slot disposed on said face of said end member parallel to and proximate said second side edge of said end member,
a plurality of spacer slots disposed on said face of said end member, said spacer slots being disposed parallel to said first and second side edges and equally spaced along said face,
a variety of top and side members, said members having top, bottom, first and second end edges and comprising
means along said end edges for slidably engaging said second and third slots of said end members and being retained therein,
a bottom member having first and second end edges and comprising
means along said end edges of said bottom member for slidably engaging said first slot of said end member and being retained therein,
means defining a raised portion disposed on said top edge of said end member,
means defining a recess in said bottom edge of said end member adapted to receive a like raised portion of another end member of a like multipurpose container, and
means defining a recess in said end edges of said bottom member, said recess adapted to receive and cooperate with said raised portion of a like multipurpose container end member to vertically align said stacked multipurpose containers.

4,232,917

COLLAPSIBLE COLUMN WITH COVERED TRAY

John H. Reinhardt, 1640 Braeburn Rd., Altadena, Calif. 91001

Filed Dec. 21, 1978, Ser. No. 971,809
Int. Cl.[2] F16M *11/00*; B61G *3/00*
U.S. Cl. 312—128 8 Claims



8. A ceiling mounted adjustable height tray comprising

a mounting bracket adapted to be mounted to a a ceiling,

a collapsible column comprising a fixed hollow column portion and first and second movable hollow column portions, said fixed hollow column portion being connected to said mounting bracket and having an aperture in one side thereof, said first movable hollow column portion being adapted to be slidably received within said fixed hollow column portion and having a pair of longitudinally separated apertures in one side thereof and a first spring biased latch engaging the upper of said apertures, and said second movable hollow column portion being adapted to be slidably received within said first movable hollow column portion and having a pair of longitudinally separatered apertures in one side thereof and a second spring biased latch engaging the upper of said apertures,

a tray connected to said second movable hollow column portion and being divided into a plurality of compartments for holding articles separately,

a cover supported by said fixed hollow column portion and adapted to cover said tray when said collapsible column is fully collapsed, and

a latch mechanism housed within said second movable hollow column portion and comprising a spring biased, pivoted bar having one end protruding from the underside of said tray and having a third latch on the other end adapted to engage the lower of said apertures in said second movable hollow column portion and to disengage therefrom when said bar is pivoted,

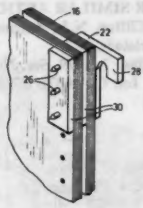
the respective apertures in said hollow column portions being located such that said collapsible column may be maintained in a fully collapsed configuration by the engagement of said third latch with said aperture in said fixed hollow column portion and the lower of said apertures in said first and second movable hollow column portions, may be maintained in a partially extended configuration by the simultaneous engagement of said first latch with said aperture in said fixed hollow column portion and the upper of said apertures in said first movable hollow column portion and said third latch with the lower of said apertures in said first and second movable hollow column portions, and may be maintained in a fully extended configuration by the simultaneous engagement of said first latch with said aperture in said fixed hollow column portion and the upper of said apertures in said first movable hollow column portion and said second latch with the lower of said apertures in said first movable hollow column portion and the upper of said apertures in said second movable hollow column portion.

4,232,918

SUPPORT SYSTEM FOR FILING COMPUTER PAPER

Karl Leber, 369 Merton St., Toronto, Ontario, Canada (M4S 1B3)

Filed Mar. 5, 1979, Ser. No. 17,246
Claims priority, application Canada, May 5, 1978, 302889
Int. Cl.[3] A47B *63/00*
U.S. Cl. 312—184 9 Claims



1. A stationery suspension system for filing a desired number of sheets of stationery having aligned holes vertically spaced along at least an upper portion of both sides thereof in a filing space having a pair of parallel spaced horizontally extending support bars, the suspension system comprising:

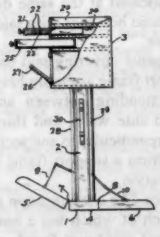
a pair of stationery engaging assemblies, each assembly having a first member with a plurality of vertically spaced parallel prongs extending therefrom, and a second member with a corresponding number of vertically spaced apertures therethrough, the prongs of the first member being adapted to be respectively received through a corresponding number of the holes along one side of the sheets of stationery, the apertures of the second member being adapted to respectively removably receive the prongs therethrough to retainably secure said one side of the sheets of stationery between the first and second members, one of the members of each assembly having a hook portion to engage a respective one of the support bars whereby the sheets of stationery may be vertically suspended together in the filing space.

4,232,919

PORTABLE STAND FOR USE IN LOADING A MUZZLE LOADING RIFLE

Nelson C. Stewart, P.O. Box 862, Franklin, N.C. 28734

Filed Jul. 26, 1976, Ser. No. 708,434
Int. Cl.[2] A47B *91/00*; A47F *7/00*
U.S. Cl. 312—254 10 Claims



1. A portable stand for use in loading a muzzle loading rifle comprising a base, an upright member rigidly attached to said base, means at the upper end of said upright member for receiv-

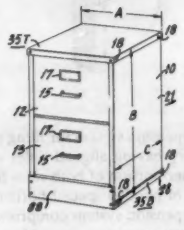
ing the muzzle of a rifle, cushion means attached to said base to receive the butt of said rifle, and channel means attached to said upright member into which said rifle can be inserted in an upright position with the butt of said rifle resting on said cushion means and the end of the muzzle of said rifle in said muzzle receiving means.

4,232,920

PREFABRICATED METAL DRAWER FILE CABINETS OR SIMILAR ARTICLES

Finley M. Bukaitz, Clifton, N.J., assignor to Kero Metal Products Co., Inc., Carlstadt, N.J.

Filed Jun. 7, 1979, Ser. No. 46,451
Int. Cl.³ A47B *87/00*
U.S. Cl. 312—257 R **10 Claims**



1. A prefabricated drawer cabinet apparatus of the type having a closed bottom surface, a closed top surface, a back wall located between said top and bottom surfaces and first and second side walls relatively perpendicular to said back wall, with a front surface containing at least one drawer slideably mounted between said side walls for storage of suitable materials, comprising:

(a) a top and a bottom box-like housing; each having two opposite side walls of equal length and height, and two additional side walls perpendicular to said opposite side walls, each of the same relative length and each of a height relatively equal to the height of said opposite side walls, said top and bottom housings each having a closed bottom surface and an open top surface,

(b) a right and a left side wall member, each of the same dimensions and mirror images of each other, said side walls each having an "L" flange along one back side thereof and a "C" flange along the other front side thereof, said side walls being positioned between said top and bottom housings and coupled to said opposite side walls of said top and bottom housings to form a box-like member, with an open front and open back, each of said side walls having at least one support flange extending therefrom and located at the same distance from one of said top and bottom housings with said supporting flanges facing each other,

(c) a back planar panel covering said back opening,

(d) a drawer support frame assembly having first and second channel members extending between and located on said flanges between said side walls, and third and fourth cross channel members perpendicular to and secured to said first and second members to form a support frame assembly of a "picture frame" configuration,

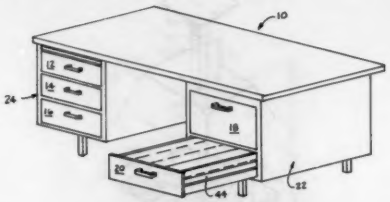
(e) a drawer of a box-like configuration and having first and second sides; each of which has a bottom flange portion for sliding on said third and fourth cross channels, said drawer positioned on said support frame for withdrawl of the same from said front end opening of said box-like member.

4,232,921

DRAWER SUSPENSION ASSEMBLY

David L. Peele, Kernersville, N.C., assignor to Miller Desk, High Point, N.C.

Filed Dec. 11, 1978, Ser. No. 968,255
Int. Cl.³ A47B *88/00*; F16C *21/00*
U.S. Cl. 312—350 **3 Claims**



1. In a suspension system for supporting a drawer from a cabinet structure wherein the drawer includes side walls defining elongated, longitudinally extending grooves therein and front and rear walls, and the cabinet structure includes a plurality of horizontally spaced, vertically disposed members, first support means recessed within and secured to said drawer side walls, and second support means secured to said cabinet structure and cooperating with said first support means, said first support means including a track member recessed within each groove and secured to and extending longitudinally of each of said drawer side walls, each said track member including an elongated channel member having a substantially C-shaped cross-section, the depth of each groove substantially corresponding to the thickness of a track member received therein such that the outermost surfaces of the track member are substantially flush with the outermost surfaces of a drawer side wall, and said second support means including generally horizontally disposed, spaced mounting plates, secured to selected vertically spaced members of said cabinet structure, each said plate including a flat, relatively thin, elongated member positioned in a vertical plane and extending generally longitudinally of said drawer side walls, said recessed track members of said flat, thin mounting plates permitting minimum spacing between said drawer side walls and said cabinet structure thereby permitting use of drawers of increased width, a plurality of horizontally spaced rollers fixedly secured to each said mounting plate and received within each said side wall recess and positioned for rolling engagement within a track member upon displacement of the drawer, said cabinet structure including a framework defined by horizontally disposed, parallel, top and bottom side rails and top and bottom end rails secured to said vertically disposed members, said vertically disposed members comprising spaced, parallel, front and rear vertical rails and vertically extending stretchers intermediate said front and rear vertical rails, and wherein said mounting plates have end portions secured to said vertical front rails and stretchers, respectively, and wherein a plurality of horizontally spaced rollers are mounted upon each said plate, one roller being secured adjacent a vertical front rail and a second roller being secured substantially midway between a vertical front rail and a stretcher.

4,232,922

SIGNAL POWER COUPLING TO ROTARY SHAFT

Horace A. Teass, Jr., 25 Mead Rd., Armonk, N.Y. 10705

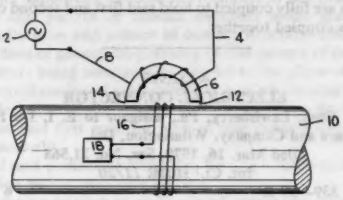
Filed Jul. 3, 1979, Ser. No. 54,611
Int. Cl.³ H01R *39/00*
U.S. Cl. 339—5 R **3 Claims**

1. A system for coupling electrical power to a load mounted on a rotary shaft without mechanically contacting the shaft comprising:

a rotary shaft;

a transformer primary having a core positioned adjacent but

spaced apart from said shaft by air gaps whereby said core, said shaft and said air gaps form a complete magnetic circuit; and



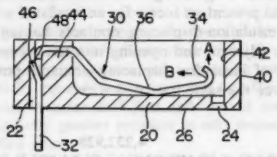
an insulated conductor abutting and wrapped around said shaft to form a winding thereon whereby said winding rotates with said shaft and is positioned to be inductively associated with said transformer primary.

4,232,923

ELECTRICAL CONNECTOR

Tomonari Otsuki, Tokyo, and Hiromasa Inouye, Musashino, both of Japan, assignors to Bunker Ramo Corporation, Oak Brook, Ill.

Continuation of Ser. No. 845,176, Oct. 25, 1977, abandoned. This application Mar. 26, 1979, Ser. No. 23,988
Claims priority, application Japan, Oct. 22, 1976, 51-141429
Int. Cl.³ H05K *1/12*
U.S. Cl. 339—17 LC **10 Claims**



1. An electrical connector for mounting on a printed circuit board, said connector comprising:

a housing having a substantially continuous bottom surface for contacting one side of a printed circuit board, said housing including at least one contact mounting passageway perpendicular to and extending through said bottom surface and said housing further having at least one contact receiving opening spaced from said passageway perpendicular to and extending through said bottom surface, said opening receiving a male contact inserted thereinto through said bottom surface in a direction perependicular to said bottom surface and parallel to said passageway;

at least one resilient conductive female contact having a terminal end extending through said contact mounting passageway, an intermediate curved portion resiliently flexed within said housing against the opposite side of said housing from said bottom surface, said intermediate portion being elongated in a direction generally perpendicularly away from said terminal end and extending substantially parallel to said bottom surface to present a low profile in a direction perpendicular to said bottom surface and thereby reducing the dimensions of the connector in a direction perpendicular to said printed circuit board, and a folded back wiping contacting end adjacent said contact receiving opening for engaging said male contact inserted into said contact receiving opening of said housing generally perpendicular to said intermediate portion, said folded back end protruding at least partially into said contact receiving opening for receiving contact mating forces from said male contact in a direction perpendicular to said contact receiving opening and substantially lengthwise along said resiliently flexed elongated intermediate portion of said female contact; and

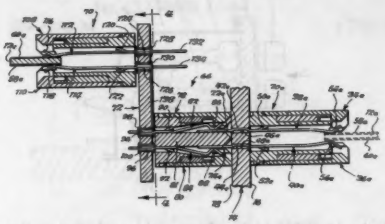
means for retaining said contact in said housing.

4,232,924

CIRCUIT CARD ADAPTER

Mark H. Kline; John T. Liebel, Jr., and Ronald D. Sheridan, all of Williamsville, N.Y., assignors to Nanodata Corporation, Buffalo, N.Y.

Filed Oct. 23, 1978, Ser. No. 953,645
Int. Cl.³ H05K *1/07*
U.S. Cl. 339—17 L **21 Claims**



1. An adapter for transferring the electrical connections of a circuit card of an electrical system from a stationary connector in a congested area on one side of a reference board to a convenient access area on the opposite side of the board, said electrical connections of said circuit card comprising a plurality of discrete electrical contact regions and said stationary connector including a plurality of contacts having a positional relationship with said contact regions for mating with said contact regions to connect said card to said system in a predetermined manner and said reference board having means on both sides for making electrical connection to said system, said adapter comprising:

(a) first means for making electrical connections to said system at a location on the opposite side of said reference board in correspondence with said contacts of said stationary connector;

(b) second means for making electrical connections to said circuit card in correspondence with said electrical contact regions of said circuit card; and

(c) means defining an electrical path between said first and second means, said path having a length significantly less than the distance measured along said circuit card in a direction outwardly of the plane of said reference board when said circuit card is connected to said stationary connector, said path defining means being arranged to convey signals between said first and second means of said adapter in a manner interchanging the connections between said first and second means relative to the positional relationship between said electrical contact regions of said circuit card and said contacts of said stationary connector on the other side of said reference board so that said circuit card is connected electrically to said system on the other side of said reference board in the same manner as it was by said stationary connector on the one side of said reference board;

(d) whereby said circuit card can be disconnected from said stationary connector and moved to said opposite side of said reference board and connected to said second means of said adapter to facilitate working on said circuit card in a manner which does not increase significantly the electrical path length from said reference board to said circuit card and in a manner such that said circuit card functions electrically in the system in the same manner as it did when connected to said stationary connector.

4,232,925

HIGH-VOLTAGE THREE PHASE ELECTRICAL SWITCH GEAR

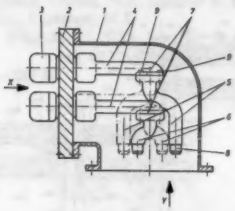
Reinhold Behnke, Mannheim; Wolfgang Wagenbach, Ofterstheim, and Erwin Müller, Karlstein, all of Fed. Rep. of Germany, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Dec. 18, 1978, Ser. No. 970,311

Claims priority, application Fed. Rep. of Germany, Dec. 16, 1977, 7738424[U]

Int. Cl.³ H01R *29/00*; H02B *1/10*

U.S. Cl. 339—31 R 6 Claims



1. An insulated high-voltage right angle connection comprising:

(a) three phase conductors;

(b) casing means arranged in a right angle bend and surrounding said phase conductors;

(c) insulation means supporting said phase conductors at the corners of an equilateral triangle;

(d) said phase conductors each including a straight section and a crank section, and means joining said sections to allow selectively positioning said crank sections at either of two positions 180° apart to enable the high-voltage right angle connection to be connected to a mating connector in either of two positions of the right angle connection which are 180° apart.

4,232,926

LOCKING MECHANISM FOR COUPLING AND UNCOUPLING ELECTRICAL CONNECTORS

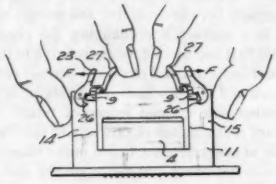
Hiromasa Inouye, Mushashino; Matsuo Kato, and Hiroaki Ito, both of Mooka, all of, Japan, assignors to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Nov. 16, 1978, Ser. No. 961,318

Claims priority, application Japan, Nov. 21, 1977, 52-155340[U]

Int. Cl.³ H01R *13/62*

U.S. Cl. 339—45 M 10 Claims



1. A locking mechanism for coupling together and uncoupling first and second electrical connector parts, comprising: at least one actuator pivotally mounted on said first connector part and having a means for applying force in both an insertion and an extractive direction as said actuator pivots, said actuator further including a latch member; at least one engageable means on said second connector part cooperating with said force applying means of said actuator to receive said force in both an insertion and an extraction direction; and a locking means on said second connector part remote from said engageable means for latching with said latch member when said actuator is pivoted in said insertion direction and said connector parts are fully coupled to hold said first and second connector parts coupled together.

4,232,927

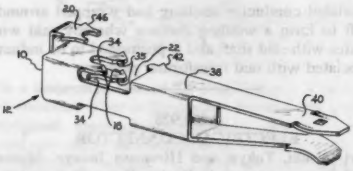
ELECTRICAL CONNECTOR

John R. Stull, Lewisberry, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 16, 1979, Ser. No. 21,568

Int. Cl.³ H01R *11/20*

U.S. Cl. 339—99 R 6 Claims



1. An electrical terminal having first and second contact ends interconnected by an intermediate bridge, said first contact end having a pair of spaced slotted insulation-displacing contacts, one above the other, said second contact end having means for engaging contact elements in other electrical circuits, said bridge being recessed in an area adjacent said first contact to present an access for an insulated wire and the slots in said insulation-displacing contacts having wire entrance openings adjacent and opening into the recess in said bridge, the pair of insulation-displacing contacts positioned so that they pierce the same insulated wire.

4,232,928

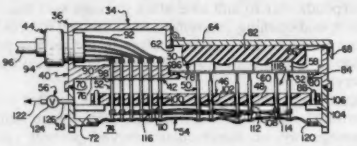
APPARATUS EMPLOYING FLEXIBLE DIAPHRAGM FOR EFFECTING SUBSTANTIALLY UNIFORM FORCE, INDIVIDUAL COUPLINGS WITH MULTIPLE ELECTRICAL CONTACTS OR THE LIKE

Price D. Wickersham, Shawnee Mission, Kans., assignor to DIT-MCO International Corporation, Kansas City, Mo.

Filed Jun. 27, 1979, Ser. No. 52,605

Int. Cl.³ H01R *4/64*

U.S. Cl. 339—117 P 7 Claims



1. In electrical interfacing apparatus for effecting concurrent, separate, electrical connections between respective ones of a plurality of individually engageable, electrically conductive, contact structures arranged in a first predetermined pattern of generally co-planar character in which some of said contact structures may be displaced in either direction from precise co-planarity with other of said contact structures and respectively corresponding ones of a plurality of individually engageable, electrically conductive, contact members arranged in a second predetermined pattern of generally co-planar character in which some of said contact members may be displaced in either direction from precise co-planarity with other of said contact members, wherein said connections to be effected preferably involve substantially equally forceful, re-

spective engagements with each of said contact structures and each of said contact members:

means for supporting said contact structures in a first spatial zone;

means for supporting said contact members in said first zone with said pattern of contact members offset generally laterally from said pattern of contact structures and with the plane of general co-planarity of said pattern of contact members being substantially parallel to the plane of general co-planarity of said pattern of contact structures;

shiftable, electrically conductive, contacting structures within said first zone for each of said contact structures respectively,

each of said contacting structures having a force-receiving portion and an engaging portion,

the engaging portion of each of said contacting structures being disposed adjacent the corresponding contact structure for engaging the latter when a force is applied to said force-receiving portion thereof;

shiftable, electrically conductive, contacting elements within said first zone for each of said contact members respectively,

each of said contacting elements having a force-receiving portion and an engaging portion,

the engaging portion of each of said contacting elements being disposed adjacent the corresponding contact member for engaging the latter when a force is applied to said force-receiving portion thereof;

fluid barrier means for separating said first zone from a second spatial zone,

said barrier means including yieldable diaphragm means having areas respectively adjacent to each of said force-receiving portions of said contacting structures and said contacting elements,

said areas being sufficiently flexible to be displaceable toward said first zone and respectively operable for forcefully engaging the force-receiving portion of the corresponding contacting structures and contacting members with substantially equal forces in response to a fluid pressure differential between said first and second zones involving a relatively greater pressure in said second zone than in said first zone;

means for creating a fluid pressure differential between said first and second zones involving a relatively greater fluid pressure in said second zone than in said first zone; and

means for electrically coupling each of said contacting structures with a corresponding one of said contacting elements.

4,232,929

MULTI-ROW PLUG CONNECTOR WITH A FITTED SHIELD PLATE

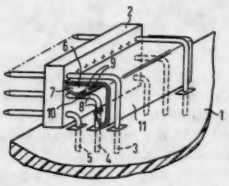
Franz Zobawa, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 18, 1979, Ser. No. 58,484

Claims priority, application Fed. Rep. of Germany, Jul. 21, 1978, 2832243

Int. Cl.³ H01R *3/06*

U.S. Cl. 339—143 R **8 Claims**



1. A multi-row plug connector pin strip for transmitting small signals with low crosstalk in data processing systems, comprising: an insulating strip having mounted therein at least one row of pins which forms a signal plane and an adjacent row of pins which forms a ground plane; a shield plate spring-clamped in position between the two rows, edges of the shield plate being inwardly bent to contact all the pins of the ground plane row; and an insulating film on the shield plate between the signal plane row and the shield plate.

4,232,930

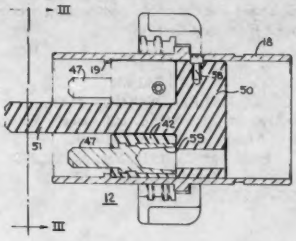
BATTERY PLUG AND RECEPTACLE FOR USE IN MINES

John J. Teti, Saltville, Va., assignor to Pyott-Boone Machinery Corp., Saltville, Va.

Filed May 1, 1978, Ser. No. 901,420

Int. Cl.³ H01R *13/64*

U.S. Cl. 339—186 M **3 Claims**



1. A connector assembly comprising mating receptacle and plug members, each comprising:

a metal housing having a cylindrical opening formed therein;

a plurality of cartridges disposed to fit within the cylindrical opening in said metal housing each cartridge having in cross section, an outer portion which defines a portion of a circle and said cartridges having inner portions which together form a selected geometrical opening when said cartridges are disposed within said housing;

each cartridge including at most one electrical connection means which forms part of only one of the electrical connections completed by the connector assembly;

an insulating keeper member disposed to hold said cartridges in place; and,

said insulating keeper of said plug member comprising a polarity prong which projects through said geometric opening.

4,232,931

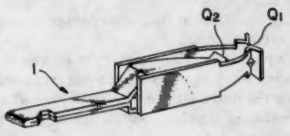
CONNECTOR FOR COAXIAL CABLES

Takeshi Takeuchi, and Takao Terasawa, both of Yokohama, Japan, assignors to Hochiki Corporation, Tokyo, Japan

Filed Dec. 19, 1978, Ser. No. 970,950

Int. Cl.³ H01R *11/22*

U.S. Cl. 339—258 R **11 Claims**



1. A connector for connecting coaxial cables comprising an axial extending wall member which is comprised of a first element folded over on itself to form a fold defining one terminating end of said wall member, said wall member having a

first section and a second section, said first section being defined by opposed and abutting portions of said first element and extending from said fold to said second section, said second section having opposed and spaced portions of said first element and extending from said first section to the other terminating end of said wall member, said opposed and spaced portions of said second section of said wall member having means thereon defining a first lip between which said coaxial cable passes, said opposed and spaced portions of said second section of said wall member having generally parallel side edges, a pair of elements disposed generally perpendicular to said opposed and spaced portions of said second section of said wall member, said pair of elements each having a first part disposed on said side edges and a second part extending axially beyond said other terminating end of said wall member, said second part of said pair of elements being spaced from one another and having means thereon defining a second lip between which said coaxial cable passes, said second lip being axially spaced from said first lip.

4,232,932

KALEIDOSCOPIC TOY

Stephen K. Atwater, 2216 Stand, and Joseph Wolfson, 224 23rd Pl., both of Manhatten Beach, Calif. 90266

Filed Apr. 23, 1979, Ser. No. 32,393
Int. Cl.³ G02B *23/00*
U.S. Cl. 350—4.1 **6 Claims**

1. An improved kaleidoscopic toy which has no moving parts and which provides a plurality of reproduceable multcolored optical shapes and patterns comprising:

a. a polygon having a plurality of inner sidewalls, each of said inner sidewalls having a mirrored surface with a plurality of transparent areas, each of which is in a particular shape and which is colored with a stain glass paint of any one of a variety of colors; and

b. means for viewing each of said mirrored surfaces of said inner sidewalls whereby an individual viewer may view a combination of oppositely disposed said inner sidewalls so that said colored transparent areas on each of said oppositely disposed inner sidewalls combines to form a unique optical pattern.

6. A method for manufacturing a kaleidoscopic toy which has no moving parts and which provides a plurality of reproduceable multi-colored optical shapes and patterns comprising the steps of:

a. forming six identical flat, square-shaped members from a transparent material;

b. using a plurality of flat members in various shapes to form a painting mask in order to provide transparent areas;

c. coating the outer surface of each of said six identical flat, square-shaped members with a first layer of mirror backing paint;

d. coating said first layer with a second layer of dark paint;

e. coating said transparent areas with stain glass paint of any one of a variety of colors; and

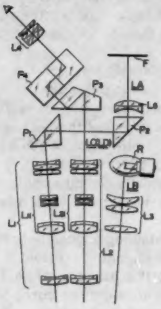
f. assembling said six identical flat, square-shaped members into a cube.

4,232,933

OPTICAL SYSTEM OF COLPOSCOPE

Kenichi Nakahashi, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jan. 12, 1979, Ser. No. 3,018
Claims priority, application Japan, Feb. 17, 1978, 53/19124[U]
Int. Cl.³ G02B *21/00*
U.S. Cl. 350—19 **12 Claims**



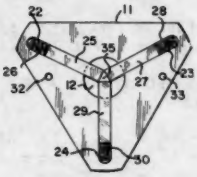
1. An optical system of colposcope comprising a pair of laterally spaced, independent observation optical sub-systems each having a family of objective lenses including a magnification varying optical sub-system, the magnification varing subsystem in one observation sub-system being ganged with the magnification varying sub-system in the other observation sub-system, a photographing optical sub-system having a family of objective lenses including a magnification varying optical sub-system which is ganged with the magnification varying sub-systems of the observation sub-systems, and an illumination optical sub-system for illuminating an object being examined, the optical axes of the four optical sub-systems being disposed so that they converge on the object being examined.

4,232,934

UNIVERSAL CONNECTOR ASSEMBLY PARTICULARLY ADAPTED FOR USE WITH FIBER OPTIC CABLES

Richard E. Feinbloom, New York, N.Y., assignor to Designs for Vision, Inc., New York, N.Y.

Division of Ser. No. 791,383, Apr. 27, 1977. This application Jun. 27, 1978, Ser. No. 918,927
Int. Cl.³ G02B *5/16*
U.S. Cl. 350—96.20 **7 Claims**



1. A connector apparatus for accommodating various diameter fiber optic cable assemblies to be exposed to a source of light contained within a housing upon which said connector apparatus is mounted, comprising:

(a) a connector housing member having an aperture directed from a top to a bottom surface, said housing having on a bottom surface, a plurality of transverse slots each communicating with said aperture and each extending transverse thereto towards a side of said housing, said slots

extending into said housing for a predetermined depth and of a width substantially narrower than said depth,

(b) a plurality of clamp members, each separate one positioned within an associated one of said slots, each of said clamp members of a "C" shaped configuration and located within said slot, with the length of said "C" from said top to bottom arms relatively equal to said predetermined depth and the width of said "C" relatively equal to said width of said slot whereby said "C" member is positioned in said slot in an upstanding relation with said main central side as joining said arms facing said aperture,

(c) a plurality of spring biasing means, each separate one positioned in one of said slots to coact with and urge said associated clamp member within said aperture, with said spring biasing means positioned between the arms of said "C" with the main side of said "C" shaped member being forced into said aperture by said spring biasing means to contact each of said clamp members similarly urged by said associated spring to cause said main sides of said clamp members to coact to form a triangular opening with each side relatively equal to the width of said slot, whereby a cable inserted in said aperture is retained therein by said clamp members coacting therewith due to the forces exerted by said spring members.

4,232,935
COMMUNICATIONS CABLE WITH OPTICAL WAVEGUIDES

Peter Rohner, Isernhagen, and Michael Still, Langenhagen, both of Fed. Rep. of Germany, assignors to Kabel- und Metallwerke Gutehoffnungshuette AG, Fed. Rep. of Germany

Filed Aug. 23, 1978, Ser. No. 936,179

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1977, 2743260

Int. Cl.³ G02B 5/16

U.S. Cl. 350—96.23 **3 Claims**

1. A flexible optical signal transmitting cable comprising:

a plurality of elongated, wave shaped, optical fibers extending in an axial direction;

a transversely corrugated, longitudinally seam welded, metallic tubular member formed about but spacially separated from said plurality of optical fibers which only partially fill the inner cross-section of said metallic tubular member;

water resistant support means that fill the unoccupied remaining portions of the complete interior cross-section of said metallic tubular member along at least longitudinal intervals of said metallic tubular member, said water resistant support means preventing axial propogation of any water penetrating the interior of said metallic tubular member and providing direct, non rigid, radial support of each of said optical fibers within each of said longitudinal intervals of said tubular member for permitting unilinear axial unfolding thereof upon tensional forces being applied thereto, said optical fibers having been continuously formed by feeding same in a longitudinal path while simultaneously shaping a metal strip about said optical fibers into a tubular member, injecting a water resistant filler material at a first point along said longitudinal path prior to the closing of the opposite longitudinal edges of said metal strip, and welding said longitudinal edges and corrugating the welded tubular member downstream of said first point; and

a tubular, flexible jacket of insulating material positioned about said corrugated metallic tubular member, including elements of high tensile strength for limiting the axial expansion of said corrugated metallic tubular member.

4,232,936
PIVOT-JOINT CONSTRUCTION FOR BINOCULAR TELESCOPE

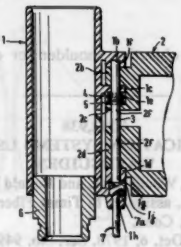
Karl-Heinz Lange, Bünde, Fed. Rep. of Germany, assignor to Balda-Werke Photographische Gerate und Kunststoff GmbH & Co. KG, Bünde, Fed. Rep. of Germany

Filed Feb. 1, 1979, Ser. No. 8,446

Claims priority, application Fed. Rep. of Germany, Feb. 1, 1978, 2804174

Int. Cl.³ G02B 7/12

U.S. Cl. 350—75 **8 Claims**



1. In a binocular telescope including a pair of optically aligned telescope tubes pivotally mounted on a connecting bridge for adjusting the interocular distance between the tubes, the improvement which comprises a pivot-joint between tube and bridge elements wherein one of said tube and bridge elements is a first element including one central hinge tab with an opening therethrough and a forward hinge tab and a rearward hinge tab spaced apart from said central hinge tab and formed with holes aligned with said opening, said other element is a second element including a forward tab between said forward and central hinge tabs on said first element and a rearward tab between said rearward and central hinge tabs on said first element and formed with holes aligned with said opening, said tabs on said second element engaging said central tab, a hinge pin through the aligned opening and holes of said tabs and means mounted in said central tab for providing friction against said engaging tabs on said second element in the direction of the pin required for maintaining the adjusted interocular distance between the telescope tubes, the surfaces of said forward and rearward hinge tabs on said first element in nonstressed relation with said adjacent hinge tabs on said second element for anchoring said pin and providing alignment between the optical axis of the telescope and said pivot-joint.

4,232,937
BRIGHT FIELD-DARK FIELD ILLUMINATION SYSTEM

Krishnaiyer Swaminathan, Santa Monica, Calif., and Milton H. Sussman, Amherst, N.Y., assignors to American Optical Corporation, Southbridge, Mass.

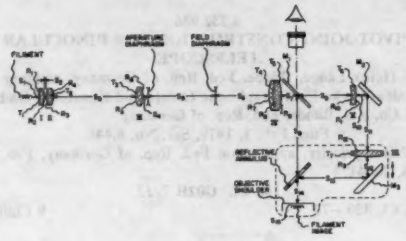
Filed Oct. 16, 1978, Ser. No. 951,684

Int. Cl.³ G02B 21/06

U.S. Cl. 350—91 **4 Claims**

1. A vertical bright-field and dark-field microscope illuminator having a light source and a microscope objective with a shoulder aligned on an optical axis, which comprises, a first lens system for collecting light from the source, a second lens system for receiving light from said first lens system and focusing an image of the source, a partially transmissive mirror selectively positionable on the optical axis to deflect light from said second lens system toward the objective for bright-field microscopy, an annular reflector located on the optical axis near the objective, an alternate optical axis used when said

mirror is positioned off the optical axis, a relay system on said alternate optical axis to focus light presented to said annular reflector near the objective shoulder for dark-field microscopy.

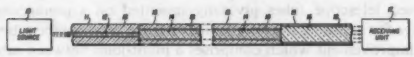


4,232,938

TELECOMMUNICATION SYSTEMS USING OPTICAL WAVEGUIDES

Franklin W. Dabby, Woodbridge, and Ronald B. Chesler, Cheshire, both of Conn., assignors to Times Fiber Communications, Inc., Wallingford, Conn.

Filed Oct. 6, 1978, Ser. No. 949,032
Int. Cl.³ G02B *5/14*
U.S. Cl. 350—96.20 **16 Claims**



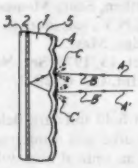
1. A method for transmitting light signals from a source of light to a receiver comprising passing light emitted from a source of light through a telecommunication system comprising at least one transmitting optical waveguide having a core of diameter d_1, connecting said source of light to least one optical waveguide cable comprising at least one optical waveguide having a core of diameter d_2 and at least one receiving optical waveguide having a core of diameter d_3, connecting said at least one optical waveguide cable to said receiver for light signals, wherein $d_1 < d_2 < d_3$ and wherein the outer diameters of said optical waveguides are equal.

4,232,939

SCREEN WITH HIGH LUMINANCE AND WIDE ANGLE

Tomoo Kikuchi, 12-35, Shimoochiai 3-chome, Shinjuku-ku, Tokyo, Japan

Filed Mar. 29, 1979, Ser. No. 25,235
Claims priority, application Japan, Jan. 4, 1978, 53-038592
Int. Cl.³ G03B *21/60*
U.S. Cl. 350—129 **5 Claims**



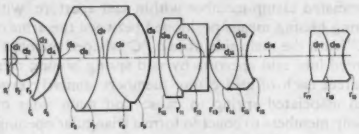
1. A screen with high luminance and wide diffusing performance which comprises: a base plate of a transparent thermoplastic resin sheet, a specular surface formed by vacuum evaporation on one side of the base plate, lenticulars formed on the other side of the base plate in continuous vertical rows and having convex surfaces, and a diffusing layer of low diffusing performance formed on the convex surfaces of said lenticulars.

4,232,940

OBJECTIVE LENS SYSTEM FOR MICROSCOPES

Jihei Nakagawa, Hagiyama-machi 5-6, Higashimurayama-shi, Tokyo-to, Japan

Filed Jun. 28, 1978, Ser. No. 919,834
Claims priority, application Japan, Jun. 29, 1977, 52-76533
Int. Cl.² G02B *3/00, 9/62*
U.S. Cl. 350—175 ML **3 Claims**



1. An objective lens system for microscopes comprising a first semispherical lens component having an embedded semispherical lens element, a second positive meniscus lens component having a concave surface on the object side, a third cemented lens component consisting of a positive element, a negative element and a positive element, a fourth cemented lens component consisting of a negative element, a positive element and a negative element, a fifth cemented meniscus lens component having a convex surface on the object side, and a sixth cemented meniscus lens component having a convex surface on the object side and arranged with a relatively wide airspace from said fifth lens component, and said lens system satisfying the following conditions:

$$-80f < f_4 < f_5 < f_6 < -29 \quad (1)$$

$$13f > |f_{456}| > 11f,\ f_{456} < 0 \quad (2)$$

$$5.5f > d_{16} > 5f \quad (3)$$

$$\nu_{12} = 2.57, \nu_{13} = 66.8 \quad (4)$$

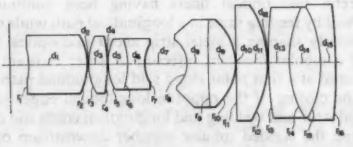
wherein the reference symbols f_4, f_5 and f_6 represent focal lengths of the fourth, fifth and sixth lens components respectively, the reference symbol f_{456} designates total focal length of the fourth, fifth and sixth lens components considered as an assembly, the reference symbol f denotes focal length of said lens system as a whole, the reference symbol d_{16} represents air space formed between the fifth and sixth lens components, and the reference symbols ν_{12} and ν_{13} designate Abbe's numbers of the two elements of the sixth lens components.

4,232,941

OBJECTIVE LENS SYSTEM FOR MICROSCOPES

Tsutomu Tojo, Hachiouji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Aug. 21, 1978, Ser. No. 935,722
Claims priority, application Japan, Aug. 26, 1977, 52-102357
Int. Cl.³ G02B *9/62*
U.S. Cl. 350—175 ML **7 Claims**



1. An objective lens system for microscopes comprising a first meniscus lens component having a concave surface on the

object side and positive refractive power, a second positive lens component, a third cemented meniscus lens component having a concave surface on the image side, a fourth cemented meniscus lens component having a concave surface on the object side, a fifth positive lens component and a sixth cemented three-element lens component, and said lens system satisfying the following conditions:

$$1.85 > n_1 > 1.70 \quad (1)$$

$$100 < (\nu_3 - \nu_4) + (\nu_6 - \nu_5) < 103 \quad (2)$$

$$\left[\frac{\theta_4 - \theta_3}{\nu_3 - \nu_4} \leqq 0.001 \, , \frac{\theta_5 - \theta_6}{\nu_6 - \nu_5} \leqq 0.001\right] \quad (3)$$

$$0 \leqq \frac{\theta_4 - \theta_3}{\nu_3 - \nu_4} \leqq 0.001 \, , 0 \leqq \frac{\theta_5 - \theta_6}{\nu_6 - \nu_5} \leqq 0.001$$

$$0.1f < d_1/n_1 < 0.3f \quad (4)$$

wherein the reference symbol d_1 represents thickness of the first lens component, the reference symbol n_1 designates refractive index of the first lens component, the reference symbols ν_3, ν_4, ν_5 and ν_6 denote Abbe's numbers of both the elements of the third lens component and both the elements of the fourth lens component respectively, the reference symbols θ_3, θ_4, θ_5 and θ_6 represent values of θ given by $\theta=(n_g-n_F)/(n_F-n_C)$ for both the elements of the third lens component and both the elements of the fourth lens component respectively and the reference symbol f designates focal length of the lens system as a whole.

4,232,942

OPTICALLY COMPENSATED ZOOM LENS

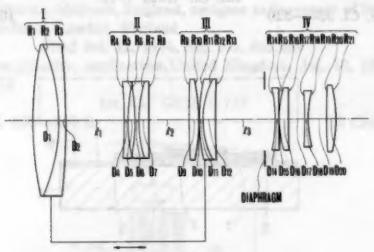
Keiji Ikemori, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 16, 1978, Ser. No. 906,630

Claims priority, application Japan, May 18, 1977, 52-57451

Int. Cl.³ G02B *15/14*

U.S. Cl. 350—184 **11 Claims**



1. An optically compensated zoom lens comprising, from the object side,

a first lens group having a positive refractive power and consisting of only a cemented bi-convex lens having a divergent contact surface;

a second lens group having a negative refractive power and consisting of a negative lens and a cemented negative lens having a convergent contact surface convex toward the front;

a third lens group having a positive refractive power and consisting of a positive lens and a cemented positive lens having a second divergent contact surface, said second divergent contact surface being of curvature of the opposite sign to that of the curvature of the first divergent contact surface of said first lens group; and

a relay lens group including a plurality of lenses with the frontmost surface concave toward the front,

whereby, when zooming, said first and said third lens groups are axially moved in fixedly spaced relation to each other on the opposite side of said second lens group and said second lens group is fixed.

4,232,943

MODIFIED PETZVAL LENS

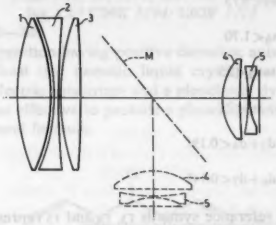
Phillip J. Rogers, Meliden, Wales, assignor to Pilkington P. E. Limited, Lancashire, England

Continuation-in-part of Ser. No. 719,361, Sep. 1, 1976, abandoned. This application Dec. 20, 1978, Ser. No. 971,481

Claims priority, application United Kingdom, Sep. 13, 1975, 37722/75

Int. Cl.³ G02B *9/34, 9/60, 17/06*

U.S. Cl. 350—202 **23 Claims**



1. A modified Petzval lens having a focal length F, the lens having a front part comprising at least one positive element with a focal length between +1F and +3F and a negative element with a focal length between −1.2F and infinity, the focal length of the front part as a whole being between +1F and +6F and the negative element of the front part not being cemented to any other element and having a refractive index less than or equal to 0.13 greater than the refractive index of any positive element of the front part, a rear part comprising a positive singlet element with a focal length between +0.4F and +1.2F, and a field flattener behind the rear part and comprising a single negative element with a focal length between 0.4F and −1.1F.

4,232,944

STANDARD PHOTOGRAPHIC LENS

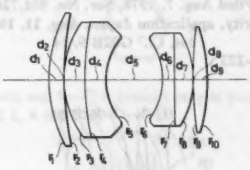
Toshihiro Imai, Hachiouji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Sep. 8, 1978, Ser. No. 940,853

Claims priority, application Japan, Sep. 13, 1977, 52-110241

Int. Cl.³ G02B *9/36*

U.S. Cl. 350—222 **4 Claims**



1. A standard photographic lens system comprising a first positive meniscus lens component, a second cemented doublet component consisting of a positive meniscus lens element and a negative meniscus lens element, a third cemented doublet component consisting of a negative lens element and a positive lens element and a forth positive lens component, and said lens system satisfying the conditions enumerated below:

$$0.41f < r_3 < 0.44f \quad (1)$$

$$0.5f < r_4 < 1.2 \quad (2)$$

$$0.25f < r_5 < 0.29f \quad (3)$$

$$0.25f < -r_6 < 0.28f \quad (4)$$

$$f < -r_7 < \infty \quad (5)$$

$$0.33f < -r_8 < 0.4f \quad (6)$$

$$0.22f < d_5 < 0.28f \quad (7)$$

$$1.71 < n_1 < 1.73$$

$$1.71 < n_2 < 1.73$$

$$1.71 < n_5 < 1.75$$

$$1.67 < n_6 < 1.70 \quad (8)$$

$$16 < \nu_2 - \nu_3 < 25 \quad (9)$$

$$14 < \nu_5 - \nu_4 < 21 \quad (10)$$

$$0.14f < d_3 + d_4 < 0.19f \quad (11)$$

$$0.10f < d_6 + d_7 < 0.14f \quad (12)$$

wherein the reference symbols r_3, r_4 and r_5 represent radii of curvature on the surfaces of the respective elements of the second lens component, the reference symbols r_6, r_7 and r_8 designate radii of curvature on the surfaces of the respective elements of the third lens component, the reference symbol d_5 denotes the airspace between the second and third lens components, the reference symbol n_1 represents refractive index of the first lens component, the reference symbol n_2 designates refractive index of the object side element of the second lens component, the reference symbol n_5 denotes refractive index of the image side element of the third lens component, the reference symbol n_6 represents refractive index of the fourth lens component, the reference symbols ν_2 and ν_3 designate Abbe's numbers of both the elements of the second lens component, the reference symbols ν_4 and ν_5 represent Abbe's numbers of both the elements of the third lens component, the reference symbols d_3 and d_4 represent thicknesses of both the elements of the second lens component, the reference symbols d_6 and d_7 designate thicknesses of both the elements of the third lens component and the reference symbol f designates focal length of the entire lens system as a whole.

4,232,945

PHOTOGRAPHIC CAMERA LENS SYSTEM HAVING A SHORT TOTAL LENGTH

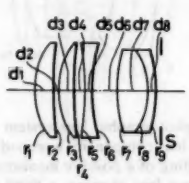
Kazushi Hyakumura, Hachiouji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Aug. 7, 1978, Ser. No. 931,726

Claims priority, application Japan, Aug. 11, 1977, 52/96274

Int. Cl.³ G02B 9/34

U.S. Cl. 350—223 **4 Claims**



1. A photographic camera lens system having a short total length comprising a first positive meniscus lens component, a second positive meniscus lens component, a third negative lens component and a fourth cemented lens component consisting of a biconvex lens element and a negative lens element, and said lens system satisfying the following conditions:

$$1.86 \leqq \phi_1 + \phi_2 \leqq 2.01 \quad (1)$$

$$0.60 \leqq \phi_1 \leqq 0.86 \quad (2)$$

$$1.77 \leqq n_2 \leqq 1.81 \quad (3)$$

$$-0.40f \leqq r_8 \leqq 23 \quad -0.35f \quad (4)$$

$$1.4 \leqq \phi_{(67)}/\phi_{(45)} \leqq 1.9 \quad (5)$$

wherein the reference symbols r_1 through r_9 represent radii of curvature on the surfaces of the respective lens elements, the reference symbols d_1 through d_8 designate thicknesses of the respective lens elements and airspaces therebetween, the reference symbols n_1 through n_9 denote refractive indices of the lens elements and airspaces therebetween, the reference symbols ϕ_1 and ϕ_2 represent refractive powers of the first and second lens components, reference symbols $\phi_{(45)}$ and $\phi_{(67)}$ represent values which are defined by the following formulae:

$$\phi_{(k)} = (n_{k+1} - n_k)\frac{1}{r_k},$$

$$\phi_{(k,\,k+1)} = \phi_{(k)} + \phi_{(k+1)} - \frac{d_k}{n_{k+1}}\phi_{(k)} \cdot \phi_{(k+1)}$$

$$k = (1.2 \ldots 9)$$

4,232,946

LIQUID CRYSTAL ALIGNMENT LAYERS

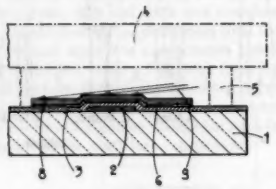
Fereydoun Gharadjedaghi, and Bernard Le Fur, both of Neuchatel, Switzerland, assignors to Ebauches S.A., Canton of Neuchatel, Switzerland

Filed Dec. 19, 1978, Ser. No. 970,981

Claims priority, application Switzerland, Dec. 28, 1977, 16115/77

Int. Cl.² G02F 1/13

U.S. Cl. 350—320 **10 Claims**

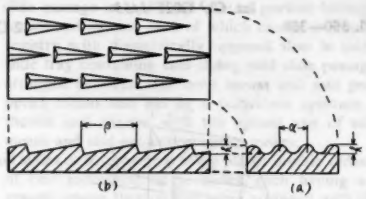


1. Method of manufacturing an electro-optic passive display cell having a helical nematic liquid crystal comprising two plates between which is disposed the said crystal, according to which one deposits on the inner face of each of the said plates an alignment film by evaporation under vacuum under an incidence ensuring an alignment of the molecules of the liquid crystal which thus orientate themselves along a direction determined by the process of evaporation, characterized by the fact that one realizes the said film by applying, on at least one of the said plates, two layers of an alignment material under an incidence of about 5°, the projection, on the plate, of the vector of application of one of the said layers forming an angle of 180° with the projection, on the plate, of the vector of application of the other layer, the whole in such a way that the molecules of the liquid crystal are then anchored on the said plate under an angle, smaller than 10°, such that the average anchoring angle on the two plates be smaller than 5°.

4,232,947
FIELD EFFECT MODE LIQUID CRYSTAL DISPLAY

Fumiaki Funada, Tenri, and Keiichiro Shimizu, Kyoto, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jul. 1, 1975, Ser. No. 592,225
Claims priority, application Japan, Jul. 1, 1974, 75689
Int. Cl.³ G02F 1/133
U.S. Cl. 350—341 **5 Claims**

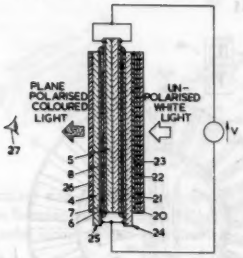


1. A liquid crystal cell comprising:
a layer of field effect mode liquid crystal material;
a pair of opposing parallel plates for sandwiching said liquid crystal layer and defining first and second interfacial surfaces therewith;
at least one of said plates being transparent;
each of said interfacial surfaces having a polarized anisotropic micro groove structure defined therein;
each said micro groove structure being characterized by substantially similar peak and valley asymmetric profiles along one axis thereof; and
said interfacial surfaces being opposed in complementary fashion such that the peaks of the said micro groove structure of one said surface are opposite the valleys of the said micro groove surface of the other said surface to thereby constrain a uniform alignment of molecules in said layer of liquid crystal material.

4,232,948
LIQUID CRYSTAL DISPLAY DEVICE

Ian A. Shanks, Malvern, England, assignor to Secretary of State for Defence, London, England

Filed Jul. 12, 1974, Ser. No. 488,069
Claims priority, application United Kingdom, Jul. 18, 1973, 34162/73
Int. Cl.³ G02F 1/133
U.S. Cl. 350—347 R **18 Claims**



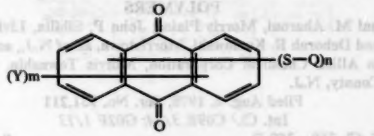
1. A liquid crystal device comprising:
(1) a liquid crystal cell capable of rotating plane polarized light and comprising:
(i) two spaced transparent slides,
(ii) a layer of a liquid crystal material comprising a cholesteric liquid crystal material having a molecular pitch substantially different from the wave length of visible light disposed between the two slides and
(iii) an electrode structure mounted on each slide for applying an electric field across the thickness of the liquid crystal layer;
(2) at least one layer of birefringent material arranged parallel to the cell; and
(3) a polarizer and analyzer arranged parallel to the cell;
the arrangement being such that when an electric field is applied to the electrode structures the color of light passing through the device is observed to vary with variation in applied electric voltage.

4,232,949
LIQUID CRYSTAL COMPOSITIONS CONTAINING PLEOCHROIC DYE

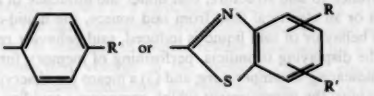
William A. Huffman, Minneapolis, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Feb. 23, 1979, Ser. No. 14,540
Int. Cl.³ C09K 3/34; G02F 1/13
U.S. Cl. 350—349 **14 Claims**

1. A composition having positive dielectric anisotropy comprising at least one nematic liquid crystal material having positive dielectric anisotropy and a pleochroic dye compound in an amount effective to provide a pleochroic character having the general formula:



wherein
Y is independently, $—NH_2$, $—NO_2$ or —OH;
Q is independently,



and (S—Q) is present only in one or more of positions 1, 4, 5 and 8;
R and R' independently represent hydrogen or a nonionic substituent;
m is 0, 1 or 2;
n is an integer from 1 to 4; and
m+n is 4 or less;
provided, that when

then n=2, m=0, and S—Q is present only in positions 1 and 4, 1 and 5, 1 and 8, 4 and 5 or 5 and 8.

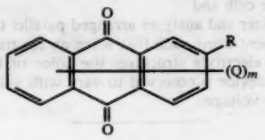
4,232,950
LIQUID CRYSTAL COMPOSITIONS INCLUDING PLEOCHROIC DYE

Judith L. Benham, Stillwater, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Feb. 23, 1979, Ser. No. 14,541
Int. Cl.³ C09K 3/34; C02F 1/13
U.S. Cl. 350—349 **14 Claims**

1. A composition having positive dielectric anisotropy comprising at least one nematic liquid crystal material having positive dielectric anisotropy and a pleochroic dye in an

amount effective to provide a pleochroic character having the general formula:



wherein

Q is independently $-NH_2$, $-NO_2$, $-OH$, $-Cl$ or $-F$;
R is $-CH_3$, $-OCH_3$ or $-H$; and
m is an integer from 1 to 4.

4,232,951

MESOMORPHIC ISOCYANATE EXTENDED RIGID POLYMERS

Shaul M. Aharoni, Morris Plains; John P. Sibilia, Livingston, and Deborah R. Kozlowski, Morristown, all of N.J., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Aug. 4, 1978, Ser. No. 931,211
Int. Cl.³ C09K *3/34*; G02F *1/13*
U.S. Cl. 350—350 R **8 Claims**

1. In a device for displaying indicia, performing memory functions or indicating temperature, comprising (1) a containing structure for liquid capable of liquid-crystalline behavior; (2) a heat source or electrical field source so positioned with reference to said structure, that under the influence of applied heat or an electrical field from said source, the liquid-crystalline behavior of said liquid is induced, said behavior resulting in the displaying of indicia, performing of memory functions, or indicating of temperature; and (3) a means for observing said behavior; the improvement which comprises providing as said liquid one from the group consisting of a liquid-crystalline polyisocyanate homopolymer or copolymer, liquid-crystalline solutions thereof, and liquid-crystalline solutions of a non-liquid-crystalline polyisocyanate homopolymer or copolymer; said homopolymer or copolymer consisting essentially of isocyanate units of formulae:

R—NCO,

wherein R is

(1) linear C_4 or linear or branched C_5–C_{12} alkyl, or substituted alkyl;

(2) linear C_4 or linear or branched C_5–C_{12} terminal alkenyl, or substituted terminal alkenyl; said formulae including, for copolymers, an admixture of isocyanate units wherein R is of formulae (1) or (2), or mixture thereof, with isocyanate units of the formula:

(3) Ar—$(CH_2)_n$—NCO, wherein Ar is phenyl or substituted phenyl and n is an integer value of 3 to 4; or an admixture of isocyanate units wherein R is of formulae (1), (2) or (3), or mixture thereof, with isocyanate units of the formula:

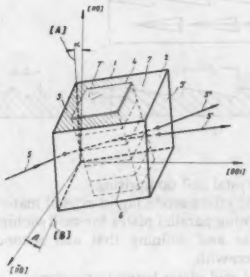
(4) R—NCO, wherein R is linear C_1–C_3 alkyl or substituted alkyl; and in the above formula (1)–(4) inclusive, any substituents on R and Ar are inert under the polymerization conditions and do not adversely affect the liquid-crystalline behavior of said polyisocyanate, and the molar ratios of Ar-containing isocyante units to R-containing isocyanate units, in said copolymers thereof, are about 4:1 to 1:3.

4,232,952

ACOUSTO-OPTIC DEVICE

Cestmir Barta; Jiri Ctyroky, both of Prague, Czechoslovakia; Iraida M. Silvestrova, and Jurij V. Pisarevskij, both of Moscow, U.S.S.R., assignors to Ceskoslovenska akademie ved, Prague, Czechoslovakia

Filed Mar. 29, 1979, Ser. No. 25,267
Claims priority, application Czechoslovakia, Apr. 1, 1978, 2106/78
Int. Cl.³ G02F *1/33*
U.S. Cl. 350—358 **2 Claims**



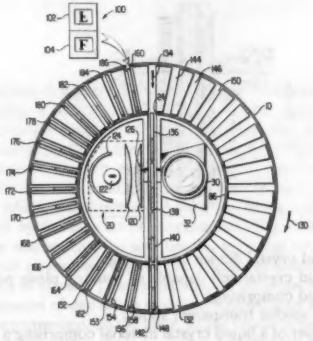
1. An acousto-optic device comprising a single crystal of pure or mixed univalent mercury halide formed in the shape of a parallelepiped having a first face provided with a source of acoustic wave, and a pair of opposite faces polished for the entrance and exit of light waves, said first face being perpendicular to the direction [A], said direction [A] being inclined from the crystallographic direction [110] about the crystallographic direction [110] by an angle α said crystal being simultaneously inclined from the crystallographic direction [110] about the direction [A] by an angle β so that the edge formerly parallel to the [110] direction points in the direction [B] and two opposite faces are simultaneously parallel to the directions [A] and [B].

4,232,953

GRAVITY-FEED ROTARY TRAY SLIDE PROJECTOR

Fernando Alvarez-Sabater, P.O. Box 3628, Caracas 101, Caracas, Venezuela

Filed Jun. 27, 1979, Ser. No. 52,952
Int. Cl.³ G09F *11/30*; G03B *23/02*
U.S. Cl. 353—111 **10 Claims**



1. In a combination slide projector and rotary slide tray wherein the slide projector includes lamp means for illuminating a slide, projection optics means for projecting an illumi-

nated slide, and means for rotating the rotary slide tray, and wherein the slide tray has slots for receiving radially arranged slides for projection, the improvement comprising:

said slide tray having diametrically opposed slots arranged vertically, and said projector having a fixed central portion positioned inside the tray, said lamp means and projection optics means being arranged on the fixed central portion of the projector at the center of said rotary slide tray;

a slide passage in said fixed central portion having an entrance and an exit, each of which can be in simultaneous registry with diametrically opposed slots in said rotary slide tray containing said slides, said slide passage being arranged between said lamp means and said projection optics means and having a projection aperture located therein and aligned with the optical axis of said lamp means and said projection optics means;

said slides to be projected being planar double slides formed of two individual single slides, each having a photographic image thereon and being arranged with like horizontal edges adjacent each other; and

said slides being contained in said slots in a predetermined pattern such that not all available slots contain a slide; whereby, upon causing said vertically arranged rotary slide tray to rotate, said slides are caused to drop from said rotary slide tray under the force of gravity into the entrance of the passage and to abut slides already in slots in the rotary slide tray such that one image of said double slide is aligned with said projection aperture and the image thereon is projected, and upon further rotation of said rotary slide tray, said slide will fall under the force of gravity into an empty slot in said rotary slide tray.

4,232,954

RECORDING POSITION ADJUSTER

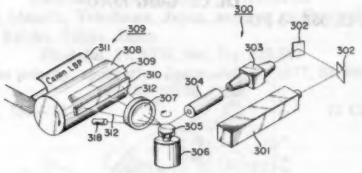
Takashi Kitamura, Yokohama; Asao Watanabe, Higashikurume; Takashi Nakano, Yokohama; Katsumi Masaki, Kodaira; Kazuhiro Hirayama, Yokohama; Yasushi Sato, Kawasaki, and Taisuke Tokiwa, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 616,675, Sep. 25, 1975, Pat. No. 4,059,833. This application Sep. 9, 1977, Ser. No. 831,919

Claims priority, application Japan, Feb. 3, 1975, 50-14544; Feb. 4, 1975, 50-14530; Feb. 4, 1975, 50-14534; Feb. 13, 1975, 50-18528; Mar. 1, 1975, 50-25120

Int. Cl.[2] G03B *15/00*

U.S. Cl. 354—7 **33 Claims**



1. A character size changing apparatus comprising:

(a) a beam forming means which, by application of character dot signals, forms a beam modulated by the character dot signals;

(b) deflecting means which deflects the beam obtained from said beam forming means to scan a recording medium;

(c) signal generating means which, by application of character signals and scanning line instructing signals, generates character dot signals corresponding to said character signals and belonging to the instructed scanning lines;

(d) counting means for forming the scanning line instructing signals, wherein said counting means advances according to the number of times the beam scans said recording medium;

(e) instructing means for instructing the size of a character to be formed on said recording medium; and

(f) control means for controlling said counting means to advance only once in response to a plurality of beam scans when a large character size is instructed by said instructing means.

4,232,955

MEMORY LOCKING MEANS OF AN EXPOSURE CONTROL CIRCUIT FOR A CAMERA

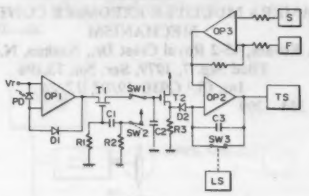
Saburo Numata, and Shinichiro Fujino, both of Urawa, Japan, assignors to Fuji Photo Optical Co., Ltd., Omiya, Japan

Continuation of Ser. No. 882,757, Mar. 2, 1978, abandoned, which is a continuation of Ser. No. 703,607, Jul. 8, 1976, abandoned. This application Aug. 30, 1979, Ser. No. 71,257

Claims priority, application Japan, Jul. 8, 1975, 50-83864

Int. Cl.[3] G03B *7/089*

U.S. Cl. 354—51 **5 Claims**



1. A memory locking means of an exposure control circuit for a camera including a light measuring circuit for constantly supplying a changing voltage output indicative of changing scene brightness, a memory circuit connected therewith for memorizing the voltage output of the light measuring circuit, and normally closed first switching means connected in series between the light measuring circuit and memory circuit which is opened in response to shutter release operation for locking and memorized voltage in the memory circuit, electronic switching means connected in series with the first switching means between the light measuring circuit and the memory circuit for locking the memorized voltage in the memory circuit independently of the first switching means, a time constant circuit connected between a power source and said electronic switching means, and normally open manually operable second switching means connected between said time constant circuit and said power source, said time constant circuit being adapted to turn on said electronic switching means when the manually operable second switching means is turned on and turn off said electronic switching means when a time period determined by the time constant circuit has lapsed since the manually operable second switching means was turned on.

4,232,956

DATA RECORDABLE CAMERA

Akihiko Hashimoto, Hachioji, and Tamotsu Koiwai, Akikawa, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Sep. 28, 1979, Ser. No. 80,160

Claims priority, application Japan, Oct. 3, 1978, 53-121833

Int. Cl.[3] G03B *17/24*

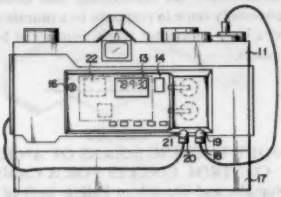
U.S. Cl. 354—106 **7 Claims**

1. A data recordable camera comprising:

data producing means for producing at least a time data and a timing data;

data recording means for converting the time data from said data producing means into an optical image to exposure a film;

data display means for displaying selectively the time data and timing data from said data producing means; and



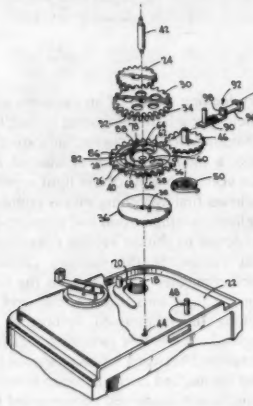
means for transferring the timing data from said data producing means to a motor drive device whereby the motor drive device is driven at a timing of the timing data.

4,232,957

CAMERA MULTIPLE EXPOSURE CONTROL MECHANISM

John M. Kovacs, 45-2 Royal Crest Dr., Nashua, N.H. 03060

Filed Sep. 7, 1979, Ser. No. 73,196
Int. Cl.³ G03B *19/02, 17/26*
U.S. Cl. 354—209 **10 Claims**



1. A multiple exposure control mechanism for a camera having a body with a magazine activating gear operable as a shutter is cocked to drive a film take-up spool via a film advance gear mechanism including a main gear means driven by the magazine activating gear and intermediate gear means coupling the main gear means with the film take-up spool in a film magazine detachably connected with the camera body, said multiple exposure control mechanism comprising

pawl means carried on and rotatable with the main gear means and movable into and out of engagement with the intermediate gear means;

cam means carried on the main gear means having a cam surface positioned to engage said pawl means and movable to control movement of said pawl means relative to the intermediate gear means; and

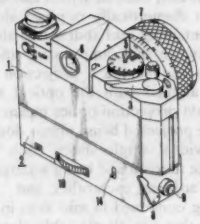
actuating means mounted on the film magazine and selectively movable to engage and move said cam means against said pawl means whereby said actuating means controls engagement of said pawl means with the intermediate gear means to selectively prevent the magazine activating gear from driving the film take-up spool when the shutter is cocked thereby permitting multiple exposures of a film frame.

4,232,958

MEANS FOR ADVANCING FILM IN CAMERAS HELD IN VARIOUS FILM FRAME ORIENTATIONS

Hidehiko Fukahori, Kawasaki; Tomonori Iwashita, Fuchu, and Yukio Mashimo, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 17, 1979, Ser. No. 58,205
Claims priority, application Japan, Jul. 18, 1978, 53-87327
Int. Cl.³ G03B *1/00, 7/26, 17/02, 17/38*
U.S. Cl. 354—212 **9 Claims**



1. For an elongated film format camera having a housing and a winding arrangement with a manual winding member and a shutter release arrangement with a shutter release member located on the housing in a first position relative to an operator's hand position for convenient use when the camera is held for an elongated, horizontal film format, a vertical format adapter comprising:

an adapter housing attachable to a camera housing,

coupling means on said adapter housing for engaging the winding arrangement and the shutter release arrangement in the camera,

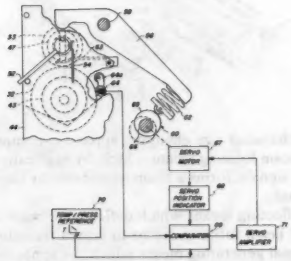
a second manual winding member and a second shutter release member coupled to the coupling means and located on the adapter housing at positions corresponding to the first manual winding member and the first shutter release member relative to the hand of an operator when the adapter is attached to the camera and the adapter and camera are held for vertical film format.

4,232,959

TONER IMAGE FUSING APPARATUS

Antoun I. Ateya, and Walter A. Stryjewski, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 5, 1978, Ser. No. 939,556
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—3 FU **8 Claims**



1. In apparatus for fusing a toner image carried by a support, and including first and second members forming a nip through which a support bearing a toner image is passed, means for heating at least one of said members and means for sensing the temperature of said at least one heated member, the improvement comprising:

means for supporting said members in variable pressure engagement; and

means for varying the pressure of engagement of said members while said members are engaged in response to the sensing by said sensing means of a change in temperature of said at least one heated member.

4,232,960

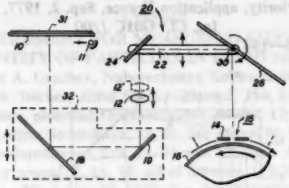
SCANNING SYSTEM

Edwin F. Glab, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Feb. 21, 1979, Ser. No. 13,098

Int. Cl.³ G03G *15/28*; G03B *27/70*

U.S. Cl. 355—8 **9 Claims**



1. A scanning system for projecting light images of a stationary object at a predetermined magnification ratio along an optical path onto a curvilinear photosensitive surface moving through an exposure station in a first direction comprising

a flat platen supporting the object,

an aperture plate located at the exposure station adjacent the path of movement of the photosensitive surface, the aperture plate enabling only that portion of the light image passing through the aperture to expose the photosensitive surface,

the aperture plate moving in a direction opposite the direction of movement of the photosensitive surface, and

an optical system disposed along the optical path between the object and the photosensitive surface, the optical system including first means movable in a linear direction towards and away from the photosensitive surface to alter the length of the optical path and a second means rotatable about an axis to scan the light image.

4,232,961

IMAGE FORMATION APPARATUS

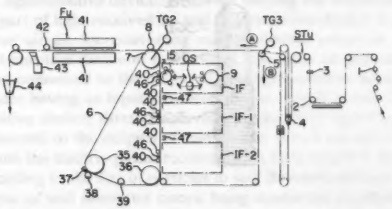
Takeshi Masuda, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 17, 1978, Ser. No. 925,547

Claims priority, application Japan, Jul. 22, 1977, 52/88175

Int. Cl.² G03G *15/00*

U.S. Cl. 355—14 R **13 Claims**



1. An image formation apparatus comprising:

means defining a plurality of drums each having an original image associated therewith;

a photosensitive medium;

means for forming a latent image corresponding to each original image on said photosensitive medium;

means for forming a visible image on the basis of the latent image;

means for transferring the visible image to a recording material; and

means for adjusting the axial deviation of each of said drums to align the original images thereon such that the transferred visible images are aligned.

4,232,962

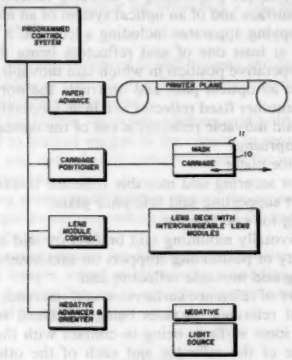
FORMAT ASSEMBLER FOR PHOTOGRAPHIC PRINTER

Mark R. Sauer, Williamson, N.Y., assignor to UNL Incorporated, Webster, N.Y.

Filed Apr. 9, 1979, Ser. No. 28,345

Int. Cl.³ G03B *27/44*

U.S. Cl. 355—46 **8 Claims**



1. A format assembler for a photographic printer having a control system controlling component movements that include movements of interchangeable lens modules with different lens arrays, a paper advance along a printing plane, and a film negative advancer and orienter, said format assembler comprising:

a. a carriage movable along a path parallel with said printing plane and extending in the direction of said paper advance between said lens modules and said printing plane;

b. a mask carried in a fixed position on said carriage to be interchangeable with other masks having different shapes;

c. said mask having a predetermined shape related to light transmitted through preselected lenses of said lens arrays;

d. means for positioning said carriage in a predetermined plurality of positions along said path for locating said mask in different positions wherein said mask blocks said light transmitted through different preselected lenses of said lens arrays;

e. said predetermined shape of said mask being arranged to block off light through preselected lenses of one lens array when said mask is in a first position to allow exposure of one longitudinal side of a paper area and then to block off light transmitted through preselected lenses of a second lens array when said mask is in a second position to allow a successive exposure on the opposite longitudinal side of said paper area without advancing said paper; and

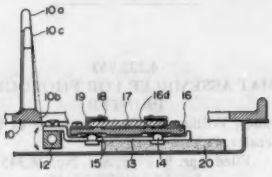
f. said control system including means for controlling said positioning of said carriage in programmed relation to said component movements.

4,232,963

DEVICE FOR POSITIONING MOVABLE REFLECTOR OF OPTICAL SYSTEM OF ELECTROPHOTOGRAPHIC COPYING APPARATUS

Tadao Koike, Tokyo, Japan, assignor to Ricoh Company, Ltd., Japan

Filed Mar. 2, 1979, Ser. No. 16,722
Claims priority, application Japan, Mar. 6, 1978, 53/27427[U]
Int. Cl.³ G03B 27/48
U.S. Cl. 355—49 2 Claims



1. A device for positioning a movable reflector having a reflection surface and of an optical system of an electrophotographic copying apparatus including a lens and a plurality of reflectors, at least one of said reflectors being movable between an operative position in which said movable reflector is disposed in an optical path and obstructs the normal optical path from another fixed reflector and in an inoperative position in which said movable reflector is out of the optical path, said device comprising:

a reference plate;

means for securing said movable reflector thereto;

a bracket supporting said reference plate;

a housing for said bracket;

means pivotally mounting said bracket on said housing;

a plurality of positioning stoppers on said housing for positioning said movable reflector; and

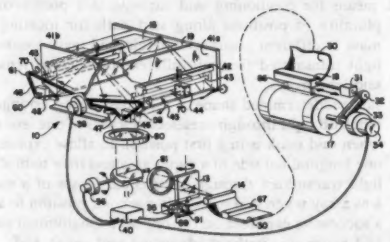
a plurality of reference surfaces on said reference plate, each of said reference surfaces being machined to the same level, some surfaces being in contact with the reflection surface of the reflector and each of the other surfaces being brought into contact with one of said positioning stoppers in a predetermined position when said reflector is in its operative position.

4,232,964

DOCUMENT ILLUMINATION SYSTEM

Eugene Nodov, Richardson; Burton W. Scott, Plano, both of Tex.; George W. Denlinger, Springboro, and Richard Sutera, Dayton, both of Ohio, assignors to The Mead Corporation, Dayton, Ohio

Filed Sep. 12, 1979, Ser. No. 75,054
Int. Cl.³ G03B 27/54
U.S. Cl. 355—70 19 Claims



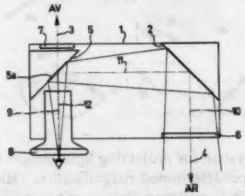
7. Document illumination apparatus comprising a document support member for supporting a document in a flat scanning plane, a pair of parallel illumination line sources positioned in a plane parallel to said flat scanning plane and at opposite ends of the area of document support, anamorphic optical means for receiving illumination from said line sources and directing substantially one-dimensional images thereof toward superimposed positions on said scanning plane, scanning means for scanning said superimposed images across said scanning plane and refocussing means for adjusting the foci of said images during said scanning.

4,232,965

OPTICAL SIGHTING DEVICE

Georges Sauerwein, Feucherolles, France, assignor to AB Broderna Kjellstrom, Stockholm, Sweden

Filed Aug. 25, 1978, Ser. No. 936,802
Claims priority, application France, Sep. 2, 1977, 77 26757
Int. Cl.³ G01C 1/00
U.S. Cl. 356—144 7 Claims



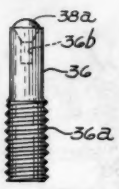
1. A handheld optical sighting device which permits simultaneous observation of two objects, one directly forward of an observer and the other directly to the rear of the observer along parallel paths comprising, sighting means and reflective surfaces enabling images of the two objects to substantially coincide when the sighting device is in alignment with and between the two objects located forward of and to the rear of the sighting device, respectively, wherein the sighting means for the forward object comprises means for directly receiving the light rays coming from said forward object so that these rays impinge an the observer's eye without being reflected, whilst light rays coming from the rear object are subjected to a 180° reflection resulting from two successive reflections of 90°, caused by said reflective surfaces before entering into the said sighting means.

4,232,966

CONTACT LENS DEVICE

Fred Schpak, Evanston, and Ian D. Malkes, Morton Grove, both of Ill., assignors to Laco Laboratories, Inc., Skokie, Ill.

Filed Jun. 12, 1979, Ser. No. 47,897
Int. Cl.³ G01N 21/01
U.S. Cl. 356—244 16 Claims



1. A device for supporting a contact lens to enable the parameters of the lens, including the curvature of the surface of the lens, to be measured with an optical instrument comprising: a body member; and a lens-engaging, solid, resilient material supported by the body member, said lens-engaging material being resiliently deformable by the surface of a contact lens in

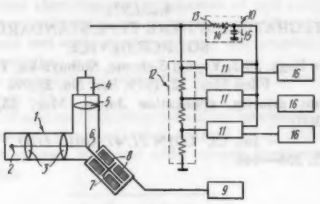
engagement therewith and capable of adhering by slight pressure to said surface of the lens whereby the lens can be oriented in any desired plane with respect to an optical measuring instrument without movement in relation to or dislodgment from the lens-engaging material, said lens-engaging material being further characterized in that it is dry, non-blocking and non-smearing with respect to said surface of the contact lens and has a refractive index such that it substantially eliminates reflection from said surface of the lens.

4,232,967

INSTRUMENT FOR MEASURING SIZES AND QUANTITY OF PARTICLES IN FLUID MEDIUM

Konstantin A. Grachev, Naberezhnaya Kosmonavtov, 3, kv. 67; Viktor A. Berber, ulitsa Shelkovichnaya, 184, kv. 65; Viktor E. Sokolov, ploschad Ordzhonikidze, 14, kv. 17; Vladimir V. Pavlov, ulitsa Sovetskaya, 21, kv. 56; Alexei N. Popov, ulitsa Zheleznodorozhnaya, 5/9, kv. 31, and Vladimir A. Zolotenko, 2 Detsky proezd, 2, kv. 18, all of Saratov, U.S.S.R.

Filed Jun. 30, 1978, Ser. No. 920,998
Int. Cl.³ G01N *15/02*
U.S. Cl. 356—336 **4 Claims**



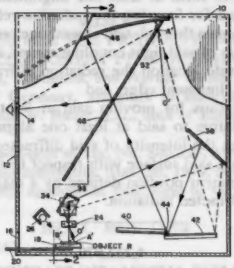
1. An instrument for measuring the size and quantity of particles in a fluid medium, comprising a dark chamber; a light source accommodated within said chamber; means for shaping a light beam emitted by said light source received in said chamber; means for introducing the fluid medium into said chamber so that it crosses the light beam shaped from the light source; an element simulating a calibrated particle mounted within said chamber; a light-sensitive device installed in said chamber to convert the light scattered by particles contained in the flow of the fluid medium which crosses the shaped light beam emitted by said light source, and also a part of the light beam, directed from said element to electric pulses; said element for simulating a calibrated particle being adapted to periodic change, in the course of measurements, the brightness of the light received by said light-sensitive device; means for varying the brightness of the part of light received by said light-sensitive device; a converter circuit for converting output electric pulses of said light-sensitive device to d.c. voltage, the input of said circuit being connected to the output of said light-sensitive device; a divider having an input connected to the output of said light-sensitive device; threshold devices having their signal inputs connected to the outputs of said divider which serves to distribute the electric pulses received from light-sensitive device according to the size of particles to said threshold devices; the output of said converter circuit being connected to reference inputs of said threshold devices whose trigger levels depend on the d.c. voltage at the output of said converter circuit; means for counting and displaying the quantity of pulses corresponding to the number of particles in the flow being studied, separately for each size group.

4,232,968

OPTICAL COMPARATOR WITH 3-D IMAGE

Paul S. Kempf, 842 Juanita, Solana Beach, Calif. 92075

Continuation-in-part of Ser. No. 895,245, Apr. 10, 1978, Pat. No. 4,168,912. This application Dec. 26, 1978, Ser. No. 972,655
Int. Cl.³ G01B *9/08*
U.S. Cl. 356—393 **11 Claims**



1. An optical comparator for providing a 3-D image to one eye, comprising:

a housing;

a holder movably mounted in said housing and having means for holding a pair of objects to be compared in spaced corresponding alignment;

a pair of projection lenses spaced from said holder and positioned to project images of the objects in separate optical paths, one optical path including means for inverting and reverting the image;

separating means positioned to receive the projected images and separate corresponding portions of the images along a common dividing line;

image forming means for forming a composite of the projected images joined at the common dividing line;

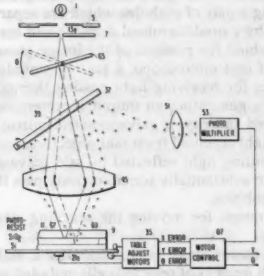
and said housing having an eye opening positioned for viewing said image forming means.

4,232,969

PROJECTION OPTICAL SYSTEM FOR ALIGNING AN IMAGE ON A SURFACE

Janusz S. Wilczynski, Ossining, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 30, 1979, Ser. No. 43,924
Int. Cl.³ G01B *11/27*
U.S. Cl. 356—401 **26 Claims**



1. A projection optical apparatus for aligning an image on a surface having at least one alignment edge, comprising:

source means for generating source radiation;

mask means for interrupting said source radiation and passing at least an alignment portion of said source radiation;

light coupling means having at least one radiation transparent portion for passing said alignment portion of source radiation in a projection direction and passing in an opposite direction a portion of radiation reflected from the surface; said light coupling means having a radiation transfer means for transmitting source radiation that is diffracted by said at least one alignment edge;

lens means for focusing said alignment portion of said source radiation to form at least one alignment image on said surface and for focusing the radiation reflected from the surface to pass through said at least one radiation transparent portion of said light coupling means, and for focusing to a separate location the radiation diffracted by said at least one alignment edge; and

alignment means for moving said at least one alignment image relative to said at least one alignment edge and monitoring the intensity of said diffracted radiation, and for aligning said surface with respect to said mask means at an alignment position defined by a maximum intensity of said diffracted radiation.

4,232,970

APPARATUS FOR AUTOMATIC DIAGNOSIS OF CELLS

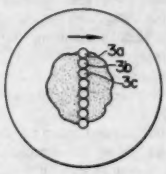
Ichiro Sawamura, and Kosaku Tsuboshima, both of Hachioji, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Mar. 13, 1978, Ser. No. 885,771

Claims priority, application Japan, Apr. 30, 1977, 52-50559

Int. Cl.[2] G01N *21/22, 33/16, 21/60*

U.S. Cl. 356—432 **4 Claims**



1. An apparatus for automatic diagnosis of cells wherein sequential steps from delivery of a sample to a diagnosis thereof are automatically performed, comprising:

a microscope having a displaceable scanning stage and an objective for producing an image of a sample;

a sample carrier including means for supporting a plurality of samples and means for delivering one of said samples to the scanning stage;

automatic focusing means for focusing the microscope with respect to the sample delivered to the scanning stage, said automatic focusing means comprising a scan sensor including a pair of pinholes which are separated from each other by a predetermined distance and are located before and behind the position of the image plane of said objective of said microscope, a pair of pinhole light sensitive devices for receiving light passing through said pinholes and for generating an output representative of the light received thereby, a galvanometric mirror located to reflect light received from said objective, and optical means for splitting light reflected by said galvanometric mirror so as to substantially simultaneously pass through each of said pinholes;

moving means for moving the scanning stage to scan said sample;

detector means for detecting diameter L and absorbance A of each nucleus of selected cells included in said sample as it moves relative to said detector means, said detector means comprising a plurality of optical fibres each having first and second ends, said first ends being disposed in alignment with each other and at a position where the magnified image of said sample is focused by said objective of said microscope for scanning said sample, and a light sensitive device for each of said optical fibres arranged opposite the second ends of said optical fibres for converting light detected by said light sensitive devices into an electrical signal;

processing means for processing the electrical signals developed by said detector means to calculate a value of AL^2 proportional to the amount of DNA included in each said nucleus of the cells selected in said sample and for generating output data representative of the processed electrical signals;

determination means responsive to said output data generated by said processing means for sorting said values of L and corresponding values proportional to AL^2 for each said nucleus of said cells selected in said sample into one quadrant of a system of coordinates with an axis of abscissas for L and an axis of ordinates for AL^2 according to whether said value L and corresponding value AL^2 are greater than or less than a predetermined reference value for L and AL^2, and for determining whether said cells are affected by cancer; and

control means for controlling the operation of said sample carrier, said automatic focusing means, said moving means, said detector means, said processing means and said determination means in the proper sequence to effect automated diagnosis.

4,232,971

INTEGRATING SPHERE TYPE STANDARD LIGHT SOURCE DEVICE

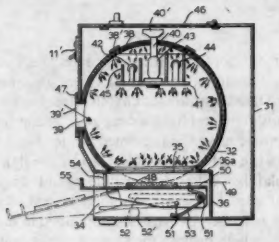
Shigeru Suga, 20-2, Yoyogi 5-chome, Shibuya-ku, Tokyo, Japan

Filed Mar. 22, 1979, Ser. No. 23,094

Claims priority, application Japan, Mar. 23, 1978, 53-036113[U]

Int. Cl.[3] G01N *21/47;* G01J *1/00*

U.S. Cl. 356—446 **7 Claims**



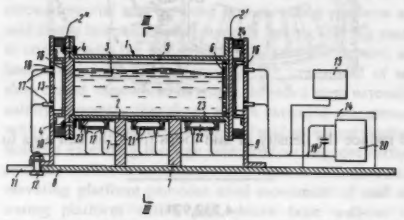
1. An integrating sphere type standard light source, comprising: a spherical shell having the inner surface coated with a white coating having a high reflectivity, said shell having a light source aperture in the top thereof, a viewing aperture in the side thereof and a specimen exposure aperture in the bottom thereof; a light source means mounted in said light source aperture and depending into said shell and including a source of light and a light shielding plate between said source of light and the remainder of the interior of said shell, said light shielding plate being coated with a white coating having a high reflectivity; a specimen supporting plate beneath said specimen exposure aperture and normally positioned for supporting a specimen at the bottommost point of an imaginary spherical surface which is an extension of the internal surface of said shell into said specimen exposure aperture; and means on which said specimen supporting plate is mounted for moving said specimen plate into and out of the normal position thereof for placing a specimen to be observed on said specimen supporting plate.

4,232,972

METHOD AND APPARATUS FOR MIXING SUBSTANCES

Igor A. Levin, ulitsa, 15, korpus 1, kv. 113, Moscow, Petrozavodskaya, U.S.S.R.

Filed Mar. 21, 1979, Ser. No. 22,437
Claims priority, application U.S.S.R., Apr. 6, 1978, 2593846
Int. Cl.³ B01F *11/00*
U.S. Cl. 366—108 20 Claims



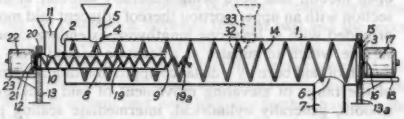
1. An apparatus for mixing substances, comprising:
a reservoir having end walls and a side wall;
a mixing means disposed within said reservoir;
a reciprocating movement mechanism of said mixing means;
a current source, having a storage capacitor, of said reciprocating movement mechanism;
eddy current electromagnetic inductors of said reciprocating movement mechanism, disposed in immediate proximity to said end walls of said reservoir and coupled to said current source;
a turn-on sequencer for said eddy current electromagnetic inductors; and
elements of said reciprocating movement mechanism, made of an electrically conductive material being disposed in intimate contact with said eddy current electromagnetic inductors.

4,232,973

CONTINUOUS MIXING APPARATUS FOR FLOWABLE PRODUCTS

Pierre Ligouzat, Chavenay, France, assignor to Societe Symac, Rueil Malmaison, France

Filed Jan. 17, 1979, Ser. No. 4,169
Claims priority, application France, Jan. 20, 1978, 78 01670
Int. Cl.³ B01F *15/02, 7/08*
U.S. Cl. 366—157 20 Claims



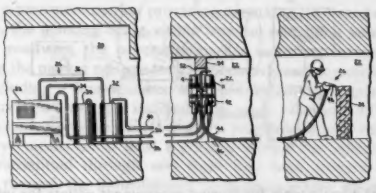
1. Apparatus for continuously mixing two flowable products, the apparatus comprising a first duct having an entry port through which a first flowable product stream can pass into the first duct and an exit port through which the mixed flowable products can pass out of the first duct, first entraining means provided with a helical element and serving to impart helical motion to the first flowable product stream within the first duct, a second duct concentrically mounted within the first duct and provided with an entry port through which a second flowable product stream can pass into the second duct, the second duct being arranged to open into the first duct between the said entry and exit ports thereof to allow said second stream to pass into the first duct, and second entraining means serving to move said second flowable product stream along the second duct, the first and second entraining means being distinct from each other and serving to move the product streams in the same direction.

4,232,974

MEANS FOR THE PRODUCTION OF A MULTI-COMPONENT PLASTICS MATERIAL

Ludwig Schmidt, Dortmund, and Werner Wellie, Essen, both of Fed. Rep. of Germany, assignors to Ruhrkohle, A.G. and Schaum-Chemie W. Bauer K.G., both of Essen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 800,224, May 25, 1977, abandoned. This application Mar. 30, 1979, Ser. No. 25,364
Claims priority, application Fed. Rep. of Germany, Jun. 2, 1976, 2624752
Int. Cl.³ B01F *15/04*
U.S. Cl. 366—162 5 Claims



1. Foam generating apparatus for producing multicomponent foam at a predetermined site in an underground mine comprising:
supply vessels for at least first and second components of the foam located at a generally fixed location remote from said predetermined site;
a fluid power source located at a generally fixed location remote from said predetermined site;
conduits connected to each of said supply vessels and fluid power source;
a pump means transportable by an operator to a temporary location in proximity with said predetermined site, said pump means comprising a protective casing adapted to be carried on the back of said operator, a plurality of independently operable pumps detachably received within said casing for being protected by same when in use in the mine, said pumps having inputs connected to said supply vessel conduits by which the components of the foam are separately received from said supply vessels and outputs by which the components are separately delivered, and a common power supply connection connected to said fluid power source conduit for driving said pumps; and
foam applying means having conduit means coupled to the outputs of said pumps for conveying the components to said predetermined site, said foam applying means mixing said components and applying same at said predetermined site to form said foam.

4,232,975

PRINT HAMMER CONTROL

Milburn H. Kane, Round Rock, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 2, 1979, Ser. No. 42
Int. Cl.³ B41J *1/26*
U.S. Cl. 400—144.2 8 Claims

1. A method of controlling impression in a daisy wheel printer having means for converting required daisy wheel selection times to carrier velocity codes, means for providing

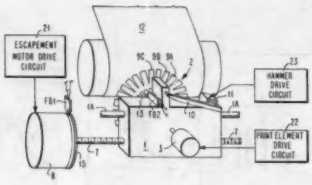
an impact force code, and storage means selectively and sequentially addressed by said codes to obtain sync information, print hammer turn on time information related to said sync information, and print hammer on time information, said method comprising:

(a) addressing said storage means with a velocity code to determine a sync point;

(b) addressing said storage means with said velocity code and an impact force code to determine a turn on time for said hammer relative to said sync point; and

(c) addressing said storage means with said velocity code and said impact force code for determining an on time for said hammer.

3. A system for controlling print impression in a carrier type daisy wheel printer having a print hammer carried by said carrier and wherein the information available to said system is comprised of carrier velocity information based upon character selection time, impact information based on a desired impact force, and carrier position information, said system comprising:



(a) a logic table for storing escapement counts for initiation of hammer cycles for characters to be printed, delays to hammer turn on times, hammer on times, and interlock times;

(b) means for first addressing said table with said carrier velocity information for a character to be printed to obtain an escapement count for initiation of a hammer cycle;

(c) means for comparing said escapement counts for initiation of hammer cycles based on said carrier velocity information with said carrier position information;

(d) means upon a comparison of an escapement count for said character to be printed and said position information for establishing a hammer sync point to be used for determining a hammer turn on time;

(e) means for determining said hammer turn on time based on both said carrier velocity and hammer impact information; and

(f) means for determining a hammer on time for said character to be printed based on said impact information.

4,232,976

RIBBON CARTRIDGE FOR PRINTING MACHINES AND MECHANISM FOR FEEDING THE RIBBON

Francesco Bernardis, and Paolo Prevignano, both of Ivrea, Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy

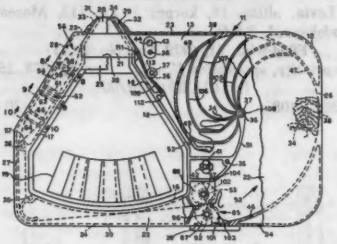
Filed Dec. 22, 1977, Ser. No. 863,420

Claims priority, application Italy, Dec. 29, 1976, 70118 A/76

Int. Cl.³ B41J *33/10*

U.S. Cl. 400—196.1 **3 Claims**

1. A cartridge for an inked ribbon for a printing machine comprising a container having a base, a lid, a series of inner walls defining a storage zone and an inked ribbon disposed in loops distributed at random in said storage zone wherein the storage zone comprises an entrance area, an exit area and a slit, said storage zone being spiral shaped to increase the space for the ribbon from the entrance area to the exit area, said inked ribbon extending through the slit to the exterior of the storage zone, wherein the base and the lid comprise a series of ribs projecting towards the inside of the storage zone, staggered with respect to each other and substantially spiral shaped so as to take the loops of the inked ribbon away from the inner walls



and reduce the density of said loops from the exit area to the slit.

4,232,977

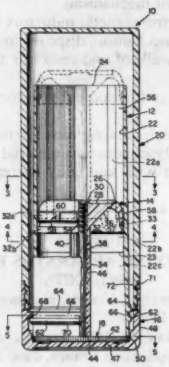
PACKAGE FOR ANTIPERSPIRANT/DEODORANT

Raymond A. Chutter, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Oct. 18, 1978, Ser. No. 952,357

Int. Cl.³ A45D *40/04*

U.S. Cl. 401—68 **2 Claims**



1. An elevating dispensing package for a stick form product, said package comprising:

an elongated sleeve of molded plastic and having a bore extending therethrough, the upper end of which defines a open mouth, said bore being generally circular in cross section with an upper portion thereof adjacent said mouth provided with at least one lengthwise extending chordal surface which terminates at a location spaced from the mouth of said bore by a distance approximating the length of the range of elevating movement of said package, a smooth, generally cylindrical, intermediate sealing portion and an unobstructed lower portion extending to the lower end of said bore;

an elevating platform of molded plastic slidably disposed within said sleeve bore and adapted for loading into said sleeve through the unobstructed lower portion thereof and to be moved from a lowermost position to an uppermost position therewithin, the platform comprising a product-support surface of generally circular conformation, a depending peripheral skirt, and an elongated, depending, threaded central stem, the upper part of said skirt being provided with lug means thereon to coact with the chordal surface of the upper portion of said sleeve bore to prevent relative rotation therebetween, said platform having a diameter across said lug means which is substan-

tially similar to that of said upper portion and of said sealing portion of the bore of the sleeve to facilitate said loading, the lower part of said skirt having an annular outwardly extending, resilient sealing means associated therewith, the lug means on the upper part of said skirt and the resilient sealing means on the lower part of the skirt being separated by a finite distance, said elevating platform in its lowermost position having said annular sealing means in interference contact with the intermediate cylindrical sealing portion of the sleeve bore to form a circumferential seal between said elevating platform and said sleeve bore and simultaneously having said lug means in contact with the upper portion of said sleeve bore; and

a handwheel rotatably mounted at the lower end of said sleeve, said handwheel having a threaded stem extending axially upwardly therefrom and in threaded engagement with the depending central stem of said elevating platform without extending through said product support surface, so that rotation of said handwheel relative said sleeve and elevating platform provides axial movement of said elevating platform within said sleeve bore without the threaded stem projecting into said product,

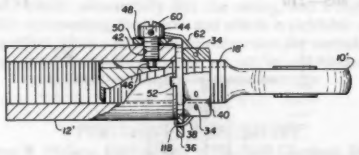
whereby said package has a vaportight lower seal when the elevating platform is in its lowermost position and the concurrent capability of axial elevating platform movement within said sleeve.

4,232,978

DOUBLE LOCKING DEVICE

Murray Cohen, Seaford, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Aug. 3, 1978, Ser. No. 930,498
Int. Cl.[2] F16B *39/00*
U.S. Cl. 403—317 **10 Claims**



1. Means to double lock a connection, said means comprising:

a first part to be used in a connection, said first part having a longitudinal bore and a slot in its end face and a bore through its sidewall into said longitudinal bore;

a second part to be inserted into and thereby joined with the first part in the longitudinal bore with means therein making the connection between the first part and the second part, said second part having a longitudinal groove;

a lock key having a groove tab within said groove and a slot tab within said slot when interposed with said first part and said second part, said lock key further having a shelf that extends over said first part with a bore through the shelf that upon seating of the slot tab in the slot is aligned with the bore through the sidewall of said first part;

a jamnut to hold said lock key such that the slot tab is in the slot and the bore of the shelf is aligned with the bore through the sidewall of said first part; and

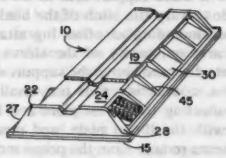
a dog screw with threads of a limited length and a reduced diameter dog extending beyond the threads, said dog screw being insertable through the bore of the shelf and threaded within the bore in the sidewall of said first part that lies under the shelf, said dog being projected into said groove to, with said lock key, prevent removal of said second part from said first part and thereby double lock the connection thereof.

4,232,979

PAVEMENT MARKER

Glenn W. Johnson, Jr., Summit, N.J., and Sidney A. Heenan, Park Ridge, Ill., assignors to Amerace Corporation, New York, N.Y.

Continuation of Ser. No. 789,266, Apr. 20, 1977, abandoned, which is a continuation-in-part of Ser. No. 681,860, Apr. 30, 1976, abandoned. This application Dec. 18, 1978, Ser. No. 970,186
Int. Cl.[3] E01F *9/04*
U.S. Cl. 404—16 **9 Claims**



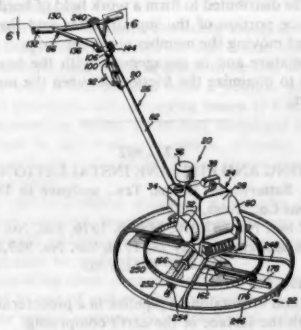
1. In a pavement marker providing a marking on a roadway surface, the marking being visible from an oncoming vehicle on the roadway, the pavement marker including means to position the marker relative to the associated roadway surface, and including a lens member of light-transmitting synthetic resin having a front face inclined at an angle of at least 15° to the associated roadway surface and a rear face having reflex reflective means on at least a portion thereof for reflecting light transmitted through said front face back toward the source thereof, the improvement comprising a thin sheet of untempered glass having a thickness no greater than about 15 mils fixedly disposed on said front face of said lens member at least in a portion of the areas overlying the reflex reflective means on the rear face of said lens member, said glass sheet being in compression throughout the expected temperature range to which the pavement marker is exposed in use, said glass sheet reducing the degradation of optical efficiency normally caused by abrasive tire contact on said lens member while allowing adequate cleaning of said pavement marker by tire-wiping action whereby the optical efficiency of said pavement marker is enhanced.

4,232,980

ROTARY POWER TROWEL

Christian T. Tertinek, Canandaigua, and Alan J. Stone, Honeoye, both of N.Y., assignors to Stone Construction Equipment, Inc., Honeoye, N.Y.

Filed Jan. 8, 1979, Ser. No. 1,786
Int. Cl.[2] E01C *19/22*
U.S. Cl. 404—112 **18 Claims**



16. In a rotary powered trowel having prime mover means,

a troweling blade assembly, drive means interconnecting the prime mover means and blade assembly to rotate said blade assembly, and handle means connected to said trowel to enable an operator to manipulate and control the trowel, that improvement comprising said troweling blade assembly including support means connected with and driven by the drive means, said support means including a plurality of sleeves, a blade support arm mounted in each of the sleeves and projecting outwardly therefrom for angular movement about the longitudinal axis of the blade support arm, a longitudinally elongated blade attached to each blade support arm, and means connected with each blade support arm to tilt the blade support arm and blade to vary the pitch of the blade, said means for tilting the blade including an offset lug attached to each blade supporting arm outwardly of the sleeve, a vertically movable thrust plate disposed above the support sleeves for the blade support arms, connecting rods universally, adjustably and positively connecting the thrust plate and lugs, a thrust bearing engaged with the thrust plate, and means operative from the handle means remote from the prime mover means to apply downward thrust on said thrust bearing, thrust plate and lugs to vary the pitch of the blades about the longitudinal axis of the portion of the blade supporting arms received in the support sleeves, said connecting rods preventing the blade from flopping freely when the trowel is lifted with the blades spaced from the working surface.

4,232,981

BEADED LIQUID PRODUCT AND METHOD FOR REDUCING COEFFICIENT OF FRICTION

Fred C. Lee, San Francisco, Calif., assignor to Bechtel International Corporation, San Francisco, Calif.

Filed Jun. 26, 1978, Ser. No. 918,899
Int. Cl.[3] F16L *1/00*
U.S. Cl. 405—154 **39 Claims**

1. A method of moving an inner member along an outer support capable of containing a flowable mixture comprising: providing a flowable, pumpable mixture of a liquid and a number of beads disposed in the liquid; moving the mixture into and along the support in a flow, the specific gravities of the liquid and the beads being different; decreasing the flow so that the beads will be distributed to form a work field of beads near one inner surface portion of the support after said flow has decreased; and moving the member along the support in contact with the mixture and in engagement with the beads in said work field to minimize the friction between the member and the support.

4,232,982

EXCAVATING AND PIPELINE INSTALLATION SYSTEM

Charles R. Satterwhite, Dallas, Tex., assignor to Unit Rig & Equipment Co., Tulsa, Okla.

Division of Ser. No. 683,970, May 6, 1976, Pat. No. 4,116,014. This application May 24, 1978, Ser. No. 909,002
Int. Cl.[2] F16L *1/02*
U.S. Cl. 405—179 **4 Claims**

1. A method of installing a pipeline in a predetermined location beneath the surface of the earth comprising:

joining a plurality of pipe sections end to end to form a pipe string;

positioning the pipe string on the surface of the earth directly above the predetermined location;

receiving the pipe string within a pipe string receiving zone located between laterally adjacent first and second excavating wheels;

rolling the pipe string over bolster rollers contained within the pipe string receiving zone;

continuously excavating a pipeline receiving trench directly beneath the received and positioned pipe string;

continuously conveying the material excavated from the pipeline receiving trench rearwardly;

rolling the pipe string under a plurality of pipe rollers;

exerting a downwardly directed force by the pipe rollers on the pipe string;

continuously positioning the pipe string in the pipe string receiving trench subsequent to the excavation thereof; and

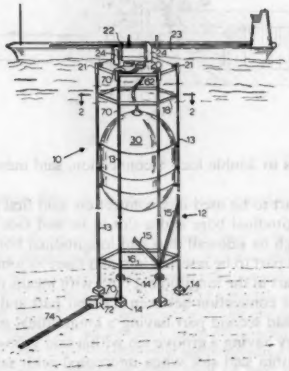
continuously redepositing the excavating material into the pipeline receiving trench on top of the pipe string positioned therein.

4,232,983

OFFSHORE SUBMARINE STORAGE FACILITY FOR HIGHLY CHILLED LIQUIFIED GASES

Sidney F. Cook, 2800 Jefferson Way SW., Corvallis, Oreg. 97330, and Mark Stolowitz, 6924 Plymouth #99, Stockton, Calif. 95207, assignors to Sidney F. Cook and Mark L. Stolowitz, both of Corvallis, Oreg.

Filed Dec. 7, 1978, Ser. No. 967,472
Int. Cl.[3] B63B *35/00*; E02B *17/00*; F17C *1/12*
U.S. Cl. 405—210 **12 Claims**



2. An offshore, submarine storage facility in the ocean and the like for liquid energy gases and the like at cryogenic liquifying temperatures, said facility comprising:

frame means in the sea aligned in a generally vertical orientation;

insulated tank means mounted to move up and down within said frame means, said tank means including:

positioning means for moving said tank means up and down within said frame means to various selected storage depths in the sea,

sea pressure transfer means for transferring ambient sea pressure at selected depths at which said tank means is positioned from time to time to the contents stored in said tank means to provide ambient pressure at said selected

depth to said contents so as to promote and maintain liquid state thereof,

volume expansion and contraction means for expanding and contracting the interior storage volume of said tank means vertically in accordance with the volume of liquid stored therein and ambient external pressure gradient applied from time to time,

insulated flexible transfer conduit means extending from the surface of the sea to said tank means for transferring liquid to and from said tank means.

4,232,984

METHOD OF ANCHORING ELEMENTS AND A DEVICE FOR CARRYING OUT SAID METHOD

Evert G. I. Sandahl, Bjärred, Sweden, assignor to Cementa AB, Malmo, Sweden

Filed Sep. 8, 1978, Ser. No. 940,663
Claims priority, application Sweden, Sep. 21, 1977, 77105674
Int. Cl.³ E04G *21/12*
U.S. Cl. 405—261 **4 Claims**

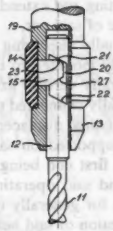
1. A cartridge for anchoring elements in rock, concrete and similar material by means of embedding a portion of the element which is to be anchored in a borehole, comprising a casing which is closed but which is penetrable by a said anchoring element to be subsequently inserted therein, a binder mixture which substantially fills the casing, and a rigidifying member surrounding the binder and which is yieldable without spring effect when a said element penetrates the cartridge, said casing being penetrable to water but not to said binder.

4,232,985

PERCUSSIVE TOOL SHAFT

Mogens B. Nielsen, Dalvangsvej 2, DK-2600 Glostrup, Denmark

Division of Ser. No. 785,165, Apr. 6, 1977, Pat. No. 4,146,240. This application Jan. 15, 1979, Ser. No. 3,402
Claims priority, application Denmark, Apr. 7, 1976, 1651/76
Int. Cl.³ B23B *51/00*
U.S. Cl. 408—226 **7 Claims**



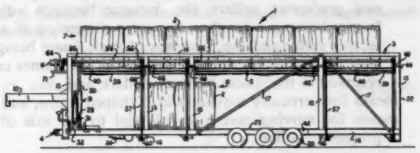
1. For use with a rotary tool holder having a socket member rotatable in at least one direction, a substantially cylindrical bore in said socket member, and a driving element defining upper edge surface means, first driving surface means, and first cam surface means, said driving element mounted in said socket member so as to be displaceable transversely to the longitudinal axis of said bore between an extended position in which part of said driving element extends into said bore, and a retracted position in which said element is retracted from said bore, a shaft for a tool of the percussive type comprising a shaft member having cutting means at one end and a free end capable of being inserted into said bore, said shaft member defining a substantially cylindrical surface, at least one recess formed in said cylindrical surface for engaging with said driving element when said shaft member is inserted into said bore, said recess being defined and spaced from said free end and forming adjacent to said free end an abutment surface means extending transversely to the longitudinal axis of said shaft member, said recess defining second driving surface means and second cam surface means, said second cam surface means having a radial distance from the longitudinal axis of said tool shaft decreasing gradually in a first rotational direction and co-operating with said first cam surface means so as to move said driving element out of engagement with said recess when said shaft member is rotated relative to said socket member in a first direction, the axial distance between said abutment surface means and said free end of said tool shaft member decreasing in said first direction and co-operating with said upper edge surface means to bring said first driving surface means into engagement with said second driving surface means to actuate said tool shaft for rotation relative to said socket member in a second direction opposite to said first direction when said abutment surface means and said upper edge surface means are pressed together by axially directed forces when said shaft member is operatively positioned within said bore, said second driving surface means having a radial distance from the longitudinal axis of said tool shaft increasing gradually in said first rotational direction.

4,232,986

TRAILER WITH MULTIPLE BALE ELEVATING APPARATUS AND METHOD OF BALE HANDLING

Howard L. Johnson, 4500 NW. 108th St., Kansas City, Mo. 64154

Filed Sep. 28, 1978, Ser. No. 946,819
Int. Cl.³ B60P *1/38*
U.S. Cl. 414—24.5 **6 Claims**



1. A multiple bale handling apparatus comprising:

(a) an elongated mobile frame;

(b) conveyor means extending along said frame, said conveyor means being capable of supporting a plurality of bales therealong;

(c) elevator platform means extending along said frame;

(d) elevating means mounted on said frame, connected to said platform means, and operable to elevate said platform means with a bale thereon from a position wherein said bale is resting on said conveying means to a height above said conveying means permitting additional bales to be received on said conveyor means, whereby said frame supports bales in upper and lower layers simultaneously for transport;

(e) said platform means including a plurality of platform sections; and said elevating means including;

(f) a plurality of shafts rotatably supported on said frame;

(g) a sprocket on each of said shafts;

(h) an elevating chain engaged with said sprocket and connected to one of said platform sections; and

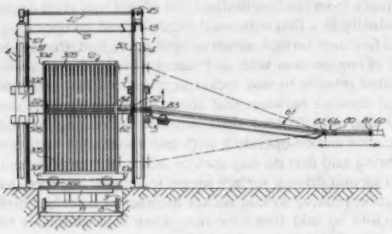
(i) motor means operatively coupled with said shafts and operable to rotate same thereby effecting elevation of said platform sections.

4,232,987

MACHINE AND SERVICE TRUCK ASSEMBLY FOR LOADING, UNLOADING AND STORING CERAMIC TILES

Giavelli Giordano, Piazza Salvo d'Acquisto, 12, Sassuolo (Modena), Italy

Filed Nov. 22, 1978, Ser. No. 963,013
Claims priority, application Italy, Dec. 16, 1977, 46926 A/77; Dec. 23, 1977, 46927 A/77
Int. Cl.[3] B65G *67/02, 39/02*
U.S. Cl. 414—331 8 Claims



1. A machine and service truck assembly for loading, unloading and storing ceramic tiles, comprising:

a horizontal frame substantially of L shape in plan, arranged to move vertically on vertical guides;

a set of horizontal conveying belts disposed orthogonally on one arm of said L frame and terminating in a belt conveyor system;

a set of motorised projecting rollers branching in plan from the other ram of said L frame and having a length approximately equal to the width of the set of conveyor belts, and forming a roller surface, said rollers each having spaces therebetween;

a service truck comprising a plurality of vertical adjacent frames each provided with equidistant horizontal cross members, said frames being disposed in planes parallel to said projecting rollers, the distance between adjacent frames being greater than the outer dimension of a projecting roller and the thickness of each frame being less than the spaces between rollers so that the frames can be received in the spaces between rollers; and

means for vertically moving said L shaped frame; and

means for moving said truck parallel to the axis of said projecting rollers.

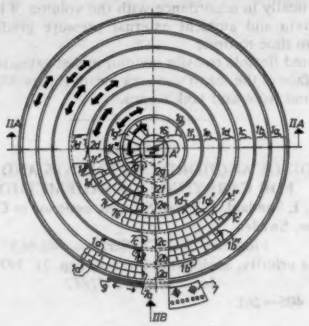
4,232,988

ARTICLE STORAGE AND RETRIEVAL SYSTEM

Uwe Kochanneck, Neuer Graben 81, 46 Dortmund, Fed. Rep. of Germany

Continuation of Ser. No. 680,876, Apr. 27, 1976, abandoned.
This application Apr. 19, 1978, Ser. No. 898,313
Claims priority, application Fed. Rep. of Germany, May 3, 1975, 2519864
Int. Cl.[3] B65G *1/133;* A47B *49/00*
U.S. Cl. 414—331 4 Claims

1. A storage and retrieval system for articles, comprising: a plurality of annular tracks which are concentric about an axis with a radially innermost track and a radially outermost track; a like plurality of trains, each train including a coaxially located cylindrical shelf for supporting storage holders, all shelves being uniformly arranged in horizontal rows and vertical columns, and each train being rotatable on a corresponding track and having a vertical gap to provide a radially directed access aisle extending to the axis when all gaps are radially aligned with each other; a stationary cylindrical shelf surrounding one of the trains and having a gap; a plurality of conveyors, each conveyor corresponding to one of the trains and being associated therewith and operating in a manner that each conveyor displaces corresponding storage holders along the columns and rows; an elevator movable along the access aisle; a plurality of drivers, each driver corresponding to and being associated with a corresponding one of the trains to



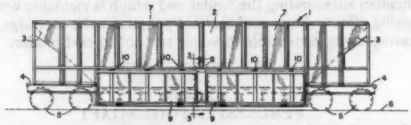
enable the corresponding one of the trains to rotate on a corresponding track; and a control coupled to the drivers and causing the trains to be driven to a predetermined angular positions with respect to the access aisle.

4,232,989

CAM ACTUATED RAILWAY HOPPER CAR DOOR OPERATING MECHANISM

Roy W. Miller, Highland, Ind., assignor to Pullman Incorporated, Chicago, Ill.

Filed May 1, 1978, Ser. No. 901,953
Int. Cl.[3] B61D *7/08, 7/18, 7/30*
U.S. Cl. 414—387 21 Claims



1. For a railway hopper car having an underframe and a longitudinally extending discharge door hingedly mounted on the car for movement laterally outward from a closed to an open position relative to a hopper having a discharge opening, an improved door operating mechanism comprising:

a longitudinal actuating rod extending beneath and carried by the underframe of said car,

means for longitudinally displacing said rod,

a bell crank pivotally mounted to the underframe for rotation about a generally vertical axis,

said bell crank pivotally connected to said rod for rotation in response to longitudinal displacement of said rod,

an operating rod, supported on said car having first and second ends, said first end being pivotally connected to said bell crank and said operating rod extending transversely therefrom for generally reciprocating movement in response to rotation of said bell crank,

a pair of vertically disposed stop members rigidly mounted to the bottom of said hopper adjacent to said discharge opening and positioned laterally outward of said bell crank,

horizontally disposed latch means supported between said stop members having a pair of hook-shaped members pivotally interconnected with each other and with said second end of said operating rod,

a latch catch rigidly affixed to said discharge door, engage-

able by said hook-shaped members for maintaining said door in a closed position, and

said hook-shaped members each including an arm appending laterally therefrom engagable by a respective stop member for pivoting said hook-shaped members relative to the second end of said operating rod in response to reciprocating movement of said operating rod, said members pivoting between a locked position between said stop members wherein said members operatively associate with each other and engage said latch catch in grasping relation and an unlocked position wherein said members are disengaged from said latch catch by said arms engaging said respective stop members.

7. In a railway car having a hopper and a hingedly mounted discharge door for movement between a closed and an open position relative to a discharge opening for the hopper, a door operating mechanism comprising:

an operating rod supported on said car selectively reciprocable between open and closed positions, movable generally transversely to the bottom edge of said hopper,

said rod having an end in the vicinity of the bottom edge of said hopper,

support means extending perpendicularly generally downward from the bottom edge of said hopper and adjacent to said discharge opening having a pair of spaced generally parallel stop members, said end of said operating rod being reciprocable along a path passing generally midway between said stop members and generally perpendicular to the plane of said stop members,

a latch catch rigidly affixed to the bottom of said discharge door,

latch means supported by said support means and pivotally connected to the end of said rod for reciprocating movement in conjunction therewith, said latch means including a pair of pivotally interconnected hook-shaped members, each hook-shaped member including a latch keeper at its outer end and an arm extending from the keeper and engageable by one of said stop members whereby said hook-shaped members are rotated in opposite directions relative to the end of said operating rod between latch catch engaging and disengaging positions in response to the reciprocating movement of said operating rod, and

each hook-shaped member having a latch lobe engageable by a portion of said latch catch whereby said latch keepers are urged toward each other to a latch catch grasping and engaging position about the latch catch in response to said discharge door being moved from an open toward a closed position,

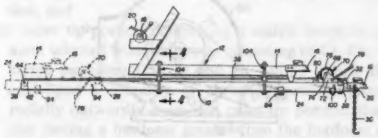
said latch means being disposed between said stop members such that said latch catch is drawn in between said stop members after engagement by said latch keepers in response to said operating rod moving into a closed position.

4,232,990

WINCH-OPERATED EXTENDABLE TONGUE FOR BOAT TRAILERS AND THE LIKE

Richard C. Pierce, R.R. #1, Stratton, Nebr. 69043

Filed Jul. 20, 1978, Ser. No. 926,526
Int. Cl.³ B60P 1/00
U.S. Cl. 414—559 **5 Claims**



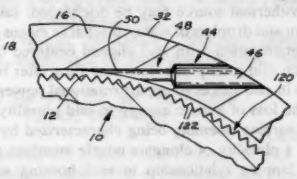
1. For use with a vehicle-drawn trailer, the winch-operated extendable tongue which comprises: a first elongate rigid tubular element having front and rear ends and an elongate slot intermediate its ends, said rear end being open; connecting means carried by the front end of said first tubular element for detachably hitching same to a towing vehicle; a second elongate rigid tubular element having an open front end and a rear end, said second tubular element being sized to telescopically receive said first tubular element for relative movement therein between a fully retracted position with the connecting means on the front end of the inner tubular element projecting forwardly beyond the open front end of the second tubular element and an extended position wherein the rear end of said first tubular element remains housed inside the second to an extent effective to cooperate therewith in defining a rigid beam; a first pulley journalled for rotation about a transverse axis adjacent the rear end of the second tubular element beyond the corresponding end of the first tubular element; a transverse shaft carried by the second tubular element spaced forwardly of the first pulley and extending into the first tubular element through the slot therein; a second pulley mounted on the transverse shaft for rotational movement thereon within said first tubular element; and, winch means carried by the second tubular element for movement therewith relative to said first tubular element, said winch means including a drum mounted for rotation about a transverse axis, means operatively associated with said drum for rotating same in either direction, and a length of cable reaved from a first point of attachment on the projecting end of the first tubular element, around the winch drum several turns, rearwardly around the first pulley and forwardly inside both tubular elements, around the second pulley and rearwardly again to a second point of attachment inside the first tubular element adjacent the rear end thereof, said winch being operative upon rotation in one direction to drive the telescoped elements apart into extended relation thus increasing the distance separating a towing vehicle fastened to the connecting means from a towed trailer or the like depending from the rear end of the second tubular element, and upon rotation in the opposite direction to drive the aforesaid telescoped elements together into retracted relation thus closing the gap separating the towing vehicle from that which is being towed thereby.

4,232,991

ROTARY MOTOR

Joseph A. Gamell, Kalamazoo, Mich., assignor to Joseph Gamell Industries, Inc., Kalamazoo, Mich.

Filed May 30, 1978, Ser. No. 910,732
Int. Cl.³ F03B 5/00
U.S. Cl. 415—90 **6 Claims**



1. In a rotary motor, the rotor of which is propelled by a jet of high-pressure fluid propellant, the combination which comprises

an annular rotor consisting of a ring having a diameter much greater than its thickness and its width, and a roughened annular surface;

a housing having a smooth annular surface apposed to said roughened annular surface and uniformly spaced therefrom in all directions;

bearing means for rotatably supporting said annular rotor consisting of apposed annular races separated by rolling means and united in freely rotating, inseparable relation one to the other and to said rolling means, said bearing means having an inside diameter at least equal to the inside diameter of said annular rotor and having one race affixed to said housing and the other race affixed to said rotor; and

jet orifices arranged to direct a plurality of jets of high-pressure fluid propellant into the space between the apposed

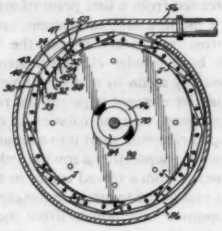
surfaces of said rotor and said housing at spaced intervals about the periphery thereof and so oriented that at least a portion thereof impinges on said roughened surface at an acute angle, said housing and said rotor having apposed spaced-apart surfaces forming a peripheral passageway communicating with the space between said first-named apposed surfaces and the ambient atmosphere, whereby said jets fan out from the point of impact on the rotor to said peripheral passageway before reaching the next jet.

4,232,992

GEOTHERMAL TURBINE AND METHOD OF USING THE SAME

Clarence R. Possell, 4842 Viane Way, San Diego, Calif. 92110

Filed Oct. 23, 1978, Ser. No. 953,650
Int. Cl.[3] F01D *1/36, 17/14;* F03G *7/04*
U.S. Cl. 415—90 11 Claims



5. A geothermal turbine assembly of the type that includes a housing that defines a confined space, a shaft rotatably supported in said housing and extending transversely through said confined space; a plurality of spaced discs supported from said shaft in said confined space, said plurality of discs having a plurality of transversely aligned center openings therein, said discs of substantially smaller diameter than that of said confined space; inlet means in an outer portion of said housing through which a pressurized and heated multiphase fluid from a geothermal source may be discharged, said fluid including steam and droplets of water; discharge means in said housing in communication with said aligned centered openings through which said multiphase fluid may flow after traversing a spiral path in said spaces to impart rotational power to said shaft due to the loss of kinetic energy to said plurality of spaced discs, said turbine assembly being characterized by:

a. a plurality of elongate nozzle members disposed in overlapping relationship in said housing exteriorly of said discs, each pair of said members cooperating to define a converging space, a throat, and a diverging space therebetween, said converging spaces in communication with said multi-phase fluid discharged into said confined space, and said diverging spaces substantially tangentially disposed relative to the outer periphery of said discs;

b. first means for pivotally supporting said nozzle bodies from said housing to permit the transverse cross-sections of said converging spaces, throats, and diverging sections to be varied to positions where said multiphase fluid discharges from said diverging openings at maximum velocity for a particular multiphase fluid of known pressure and temperature; and

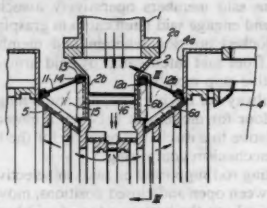
c. second means for removably locking said nozzle bodies in fixed positions relative to one another after said nozzle bodies have been pivoted to positions where said multiphase fluid discharges at said maximum velocity from said diverging spaces.

4,232,993

LOW PRESSURE CASING FOR A STEAM TURBINE

Tadasu Ikeda, and Takamitsu Taki, both of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Jun. 2, 1978, Ser. No. 911,925
Claims priority, application Japan, Jun. 13, 1977, 52/68887
Int. Cl.[3] F01D *3/02, 25/26, 25/08*
U.S. Cl. 415—103 4 Claims



1. A low pressure casing of a single shell type for a steam turbine which houses a turbine rotor therein, comprising:

steam admitting means located in an upper central part of said casing and formed therein with a steam admitting port for admitting turbine driving steam therethrough into the interior of said casing;

turbine diaphragm means rigidly secured to an inner surface of said casing for supporting stationary blades arranged in a multiplicity of stages axially of the turbine;

exhausted steam chamber means disposed at opposite ends of said casing axially of the turbine for receiving steam of low temperature and low pressure exhausted thereinto after doing work in the turbine; and

shell means of the casing connecting said steam admitting means to said exhausted steam chamber means;

wherein the improvement comprises:

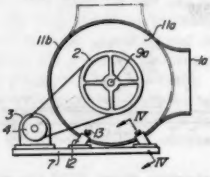
wall means enclosing an outer periphery of the shell means of said casing and connected at its end to said steam admitting means and said exhausted steam chamber means, temperature moderating spaces being defined between an inner surface of said wall means and an outer surface of the shell means of the casing, whereby the temperature differential produced between the outer and inner surfaces of the shell means of the casing can be minimized, and wherein said wall means comprises rings which are frusto-conical in shape and have a larger diameter at one end thereof which is disposed near said steam admitting means than at the other end thereof which is disposed remote from said steam admitting means.

4,232,994

CENTRIFUGAL TURBOMACHINE

Koh Tsuji, Ebina, Japan, assignor to Hitachi, Ltd., Japan

Filed Dec. 30, 1977, Ser. No. 865,875
Claims priority, application Japan, Jan. 14, 1977, 52-2404
Int. Cl.[3] F01D *25/24*
U.S. Cl. 415—127 1 Claim



1. A centrifugal turbomachine comprising:

an impeller mounted on a rotatable shaft,

a housing for said impeller in the form of a spiral casing having suction and discharge ports therein, said suction

port having its center line aligned with the axis of said rotatable shaft, and the center line of said discharge port and the axis of said rotatable shaft lying substantially in a plane,

a base for mounting said spiral casing thereon,

an outer casing provided outside of said spiral casing and being in the form of a cylinder concentrical with the axis of said rotatable shaft over at least three-fourths of the circumference of said cylinder, a portion of said outer casing merging in an overlapping relation with a discharge port of said spiral casing and forming a unitary structure therewith, and an end portion of said outer casing extending to the outside of a side plate of said spiral casing, and

mounting means secured to said base and including arcuate slots having a diameter equal to the outer diameter of said outer casing and having a central angle of arc smaller than 180°, the end portion of said outer casing being adjustably secured in said slots by fastening means whereby the discharge direction of fluid flow from said turbomachine may be adjusted by adjusting the position of said unitary structure relative to said base and mounting means.

4,232,995

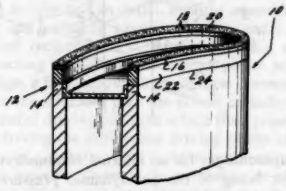
GAS SEAL FOR TURBINE BLADE TIP

Kenneth W. Stalker, Cincinnati; John W. Zelahy, West Chester, and Norman P. Fairbanks, Cincinnati, all of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Division of Ser. No. 863,017, Dec. 21, 1977, Pat. No. 4,169,020. This application Nov. 27, 1978, Ser. No. 963,864

Int. Cl.[2] F01D *11/08*

U.S. Cl. 415—172 A **4 Claims**



1. A turbomachinery blade including a blade body and a blade projection about the radial outer periphery of the blade body, the projection including a metallic body and an abrasive outer tip, the improvement comprising:

said outer tip of said projection is a composite of an inner tip portion and an outer tip portion,

the inner tip portion comprising a shaped member discrete from the projection body, of an alloy resistant to oxidation, sulfidation and thermal fatigue at operating temperatures, and bonded with the metallic body of the projection, and

the outer tip portion comprising a matrix based on an element selected from the group consisting of Cr, Co, Ni and alloys including Cr, Co and Ni and in which there is entrapped a plurality of abrasive particles protruding radially outwardly from said outer tip portion, the particles having a hardness greater than the hardness of said surface of the other member, the outer tip portion bonded with said inner tip portion,

the thickness of the matrix being less than the longest dimension of the abrasive particles in the direction of their protrusion from the outer tip portion.

4,232,996

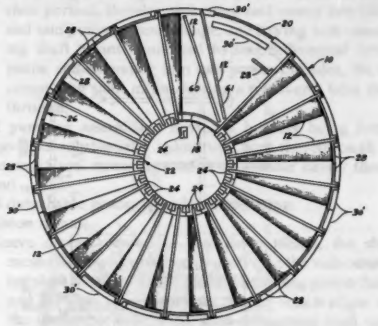
LIGHT WEIGHT FAN ASSEMBLY

Lewis J. Stoffer, Cincinnati, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 6, 1978, Ser. No. 949,368

Int. Cl.[3] F04D *29/34*

U.S. Cl. 416—191 **3 Claims**



1. A fan assembly, comprising: a plurality of fiber reinforced composite hub support hoops; a plurality of fiber supported composite tip support hoops radially spaced from said hub support hoops; a plurality of fiber reinforced composite fan blades positioned between the hub support hoops and the tip support hoops; a segmented fiber reinforced composite hub platform secured to said blades with the hub support hoops held between the blades and the hub platform segments and a segmented, fiber reinforced composite tip platform secured to said blades; a plurality of metal channel segments positioned adjacent the tip hoops between the tip hoops and the blades; the hub platform segments and tip platform segments being secured to the blades with heat-and-compression-cured locking pins; said blades, said hub platform segments and said tip platform segments having reinforcing fibers passing around the locking pins.

4,232,997

METHOD AND APPARATUS FOR CONTROLLING COMPRESSORS

John E. Grimmer, Franklin, and Robert L. Donahue, Indianapolis, both of Ind., assignors to Grimmer Schmidt Corp., Franklin, Ind.

Filed Apr. 27, 1978, Ser. No. 900,426

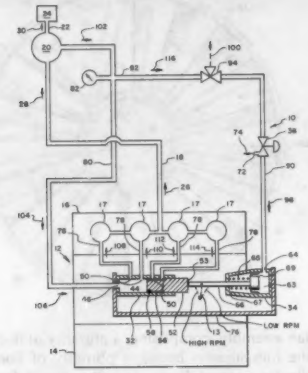
Int. Cl.[3] F04B *49/02*

U.S. Cl. 417—4 **21 Claims**

1. Control apparatus for a compressor having at least two compression chambers, each with a compressed air output proportional to compressor speed, said chambers being arranged in a parallel feeding relation to a common delivery conduit which receives airflow from one chamber independently of the pumping operation of the other chamber, unloading means operable on said chambers to selectively bring in said chambers one at a time for pumping and take out said chambers one at a time from pumping and a variable speed prime mover driving said compressor having a speed regulating member adapted to change the speed of the compressor, said control apparatus comprising:

control means responsive to compressed air demand on said compressor including a movable control member arranged for simultaneously adjusting both said unloading means and said speed regulating member in relation to air pressure demand on the compressor in increments over a range of compressor speeds at and between two different selected speed settings and in increments over a range of air pressure demands, the air flow rate in said common

delivery conduit being changed by bringing in for pumping or taking out from pumping selected of said compression chambers at a selected compressor speed, said control and speed regulating members being varied so that as the demand increases the compressor speed and the number of chambers pumping are simultaneously increased to increase compressed air output from said compressor and as the demand decreases the compressor speed and the number of chambers pumping are simultaneously decreased to decrease compressed air output from said compressor over said ranges of compressor speed and air pressure demand, said movable control member being arranged to automatically return to a position establishing a minimum operating condition of minimum speed and minimum power input for the compressor when there is essentially no demand on said compressor.

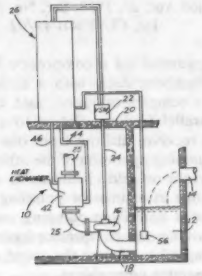


4,232,998

METHOD AND APPARATUS FOR REGULATING ELECTROLYTE SOLUTION LEVEL IN A LIQUID RHEOSTAT

George M. Osgood, 4474 SW. Arthur Way, Portland, Oreg. 97221

Filed Mar. 17, 1978, Ser. No. 887,634
Int. Cl.³ F04B *49/06*
U.S. Cl. 417—36 **9 Claims**



1. Apparatus for pumping liquid from a well comprising:

pump means driven by a variable speed electric motor operable for pumping liquid from the well;

a liquid rheostat operatively connected to said electric motor for controlling the speed thereof, said liquid rheostat including an electrode compartment and an electrolyte solution reservoir, said compartment including drain means for permitting solution contained therewithin to be drained into said reservoir;

a circulating pump driven by a second variable speed electric motor operable for circulating solution from said reservoir to said compartment through a conduit; and

control means operable for selectively regulating motor speed of said circulating pump in response to the amount of liquid in the well to thereby regulate solution level in said compartment.

9. A method for regulating electrolyte solution level in a liquid rheostat, said liquid rheostat being used in a system for pumping liquid from a well and including an electrode compartment interconnected by a conduit to an electrolyte solution reservoir comprising:

circulating the solution through the conduit from the reservoir to the compartment by a motor-driven circulating pump;

sensing liquid level in the well; and

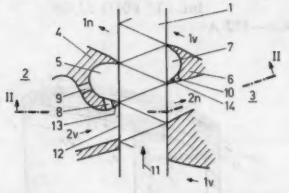
controlling the circulating rate of said circulating pump in response to changes in the amount of liquid in the well by controlling the motor speed of the circulating pump.

4,232,999

SUPERCHARGERS FOR INTERNAL COMBUSTION ENGINES

Nicolaus Croes, Baarn, Netherlands; Hansulrich Hörler, Zurich, and Hubert Kirchhofer, Gebenstorf, both of Switzerland, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Continuation-in-part of Ser. No. 722,420, Sep. 13, 1976, abandoned. This application Aug. 11, 1978, Ser. No. 932,954
Claims priority, application Switzerland, Oct. 10, 1975, 13198/75
Int. Cl.³ F04F *11/02*
U.S. Cl. 417—64 **11 Claims**



1. In a supercharger for an internal combustion engine, the supercharger being of the gas-dynamic pressure-wave type comprising first and second spaced housing portions forming a rotor chamber therebetween, a rotor mounted for rotation in said rotor chamber, said rotor comprising a plurality of open-ended cells, a high pressure feed duct disposed in said first housing portion for conducting hot high-pressure engine exhaust gas into said rotor cells, a low pressure discharge duct disposed in said first housing portion for conducting expanded low-energy exhaust gas, a low pressure feed duct in said second housing portion for conducting combustion air to be compressed, a high pressure discharge duct disposed in said second housing portion for conducting combustion air compressed by said high pressure exhaust gas in said rotor cells, a pocket formed in at least one of said housing portions between said high and low pressure ducts thereof, said pocket being open toward the rotor chammber and separated from said adjacent high pressure duct by a wall portion of the associated housing portion, the improvement wherein an opening is formed in said wall portion between the associated pocket and high pressure duct for conducting fluid from the latter to the former in a direction transversely of the direction of travel of fluid in said last-named high-pressure duct, said opening being open toward said rotor chamber and having a height less than the height of said last-named high-pressure duct, said opening including a depth of sufficient magnitude that the outer portion of said

opening remote from said rotor chamber is essentially unobstructed by pressure waves from said rotor cells, the cross-sectional area of said opening being dimensioned to conduct fluid quantities in excess of a predetermined amount from said last-named high-pressure duct.

4,233,000

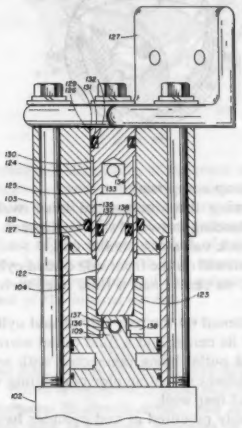
VARIABLE RATIO INTENSIFIER

Bruce M. Cox, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Continuation of Ser. No. 896,664, Apr. 17, 1978, abandoned. This application Dec. 3, 1979, Ser. No. 99,449

Int. Cl.³ F04B *21/04*

U.S. Cl. 417—402 **4 Claims**



1. An improved hydraulic pressure convertor including a body having an inlet and an outlet, a motor assemblage carried by the body and including a power cylinder and a differential driving piston reciprocable therein, a pumping assemblage, means connecting the differential driving piston to the pumping assemblage, a first conduit in continuous communication at one end with the inlet and with the power cylinder at the side of the differential driving piston to which fluid pressure is to be applied for driving the differential driving piston on its power stroke, a second conduit continuously in communication at one end with the power cylinder at the opposite side of the differential driving piston, each of said conduits having a valving port spaced from its said one end, a valve operative in a first operating position in which it blocks the valving port of the first conduit and concurrently connects the valving port of the second conduit with the outlet and operative in a second operating position in which it effects communication of said ports with each other and concurrently stops communication of the second port with the outlet, lost motion connecting means connecting the valve to the differential piston so as to effect actuation of the valve toward said first operating position past a predetermined center position as the differential piston is moved a predetermined distance on its power stroke and to effect actuation of the valve toward said second operating position past said center position as the differential piston is moved a predetermined distance on its return stroke, and over-center spring means connected to the valve and operative when the valve is actuated past said center position in directions toward said first and second operating positions, respectively, to drive the valve with a snap action to the one of the said first and second operating positions toward which the valve was being actuated as it passed said center position, wherein the improvement comprises:

said hydraulic pressure convertor having a variable ratio of the pressure of the outlet fluid from said pumping assemblage to the pressure of the inlet fluid to said motor assemblage by varying the size of a detachable piston assembly attached to said differential driving piston in said power cylinder and varying the size of a pumping assemblage means operatively associated with said detachable piston assembly, wherein

said differential driving piston comprises a driving piston having stem means operably associated with said motor assemblage, having differential piston connected to the stem portion, thereby separating said motor assemblage and said pumping assemblage, and having stub connecting shaft means connected to said differential driving piston and extending into said power cylinder, the stub connecting shaft means having a transverse bore therethrough;

said pumping assemblage having a housing being formed having a substantially cylindrical bore therethrough and having a seal means located in an annular cavity therein; and

said detachable piston assembly comprising:

piston means;

sleeve means secured to the piston means, the sleeve means having a bore therein receiving the stub connecting shaft means of said differential driving piston therein and having a transverse bore therein which aligns with the transverse bore in the stub connecting shaft means of said differential driving piston when the sleeve means is assembled thereto; and

resilient pin means securing the sleeve means to the stub connecting shaft means of said differential driving piston by engaging the transverse bore in the sleeve means and the transverse bore in the stub connecting shaft means.

4,233,001

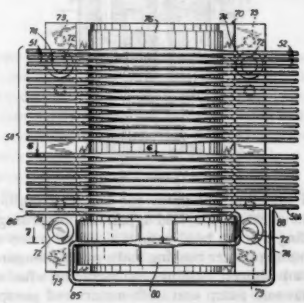
PERISTALTIC PUMP

Carl J. Schmid, Port Washington, N.Y., assignor to Peerless Electronics Research Corporation, Westbury, N.Y.

Filed Feb. 28, 1979, Ser. No. 16,161

Int. Cl.³ F04B *43/12, 45/08*

U.S. Cl. 417—475 **13 Claims**



1. Pumping apparatus comprising, in combination:

an array of compressible tubes in parallel substantially coplanar relationship with each other;

rotor means located adjacent one side of the array of tubes in position to simultaneously occlude each of said tubes between a first part of spaced points along the length of the tube;

means supporting the rotor means for rotational movement relative to the array of tubes;

a platen assembly located adjacent the other side of the array of tubes in position to urge the same into contact with the rotor means, the platen assembly having a first ledge portion facing the periphery of the rotor means for defining the location of said first pair of spaced points and a

second ledge portion facing the periphery of the rotor means for defining the location of a second pair of spaced points;

means for rotating the rotor means to progressively occlude the compressible tubes between said first pair of spaced points and thereby pump a first fluid through the tubes in a given direction; and

an additional compressible tube containing a fluid different from said first fluid, the additional tube extending in said given direction between the rotor means and the first ledge portion of the platen assembly, then back in a direction opposite to said given direction between the rotor means and the second ledge portion of the platen assembly, and then to a junction point in open communication with one of the tubes in said array;

the rotation of said rotor means progressively occluding said additional compressible tube between said first pair of spaced points, to pump said different fluid therethrough in said given direction, and progressively occluding said additional compressible tube between said second pair of spaced points, to periodically admit said different fluid to said one tube in timed relation to the flow of the first fluid therein.

4,233,002

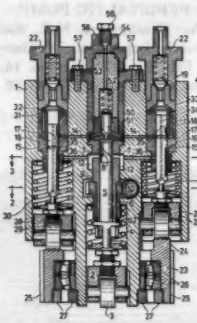
FUEL INJECTION SYSTEM

Benjamin Birenbaum, 133 Richmond St. West, Toronto, Ontario, Canada (M5H 2L7)

Continuation-in-part of Ser. No. 768,843, Feb. 15, 1977, abandoned, which is a continuation-in-part of Ser. No. 660,912, Feb. 26, 1976, abandoned. This application May 9, 1978, Ser. No. 904,199

Int. Cl.³ F02M *41/04;* F04B *23/00*

U.S. Cl. 417—485 **2 Claims**



1. A fuel injection apparatus for use in a multi-cylinder internal combustion engine; said apparatus comprising a pump head, including a pump head casing; a central pump unit consisting of a pump plunger bushing and a pump plunger reciprocal in the pump plunger bushing, and including a fuel metering means so that said pump unit both meters and pumps fuel; a distributor apparatus comprising a plurality of distributor valves arranged in a circular pattern about said central pump unit, and including valve plungers; a rotary distributor cam having a single distributor lobe for orbiting in said circular pattern and moving said valve plungers in succession from a non-distributing to a distributing position in sequence with the delivery stroke of said pump unit; said distributor having a planar face for holding said valve plungers stationary when in the distributing position through the entire delivery stroke of said pump unit; spring means for returning said valve plungers to said non-distributing position where they rest on a flat surface of said distributor cam through said casing and into said pump plunger bushing; delivery ducts extending from said pump plunger bushing; delivery ducts extending from said pump unit to said distributor valves; and cam and spring means for reciprocating said pump plunger, each of said distributor valves distributing in succession fuel metered and pumped by said pump unit.

4,233,003

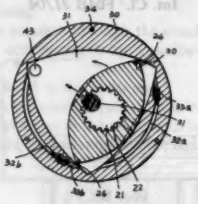
ROTARY PUMP

Wang-Shing Jeng, 6-1, Alley 27, La. 278, Yung Chi Rd., Taipei, Taiwan

Filed Oct. 10, 1978, Ser. No. 949,894

Int. Cl.³ F04C *18/02, 23/00, 29/08*

U.S. Cl. 418—8 **8 Claims**



1. A rotary pump comprising:

a cylinder having three connected inner walls, and two channels extending in two of said walls, each said channel having a check valve at a similar end;

a front wall fastened on the front side of said cylinder having a bearing at its center and a fluid inlet surrounding said bearing;

a rear wall fastened on the rear side of said cylinder having a bearing at its center and a fluid outlet surrounding said bearing, said outlet being connected with an exhausting pipe and another exhausting pipe connecting with a check valve on said rear wall;

a piston rotatably mounted in said cylinder having two arc surfaces and a circular internal hole, each said surface including a groove at its center and an outlet port and an inlet port located on both sides of the groove, and both of said ports having check valves therein, said internal hole having a gear section and an enlarged section having a smooth surface;

a shaft supported by said two bearings on said front and rear walls, said shaft including three sections, a front section having a gear, a middle section of circular rod having a smooth surface and a diameter similar to the gear section, and an enlarged rear section having a smooth surface;

a separating plate closely rotatably mounted in the rear section of said piston hole and having a shaft hole corresponding to the middle section of said shaft;

a plunger closely rotatably mounted in the rear section of said piston hole having a fluid passage and a shaft hole corresponding to the rear section of said shaft, and having a thickness of slightly larger than the diameter of the outlet ports on said piston.

4,233,004

SEAL FOR AN ECCENTRIC-ROTOR MACHINE

Erich Gaschler, Wolfsburg, Fed. Rep. of Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

Filed Mar. 5, 1979, Ser. No. 17,542

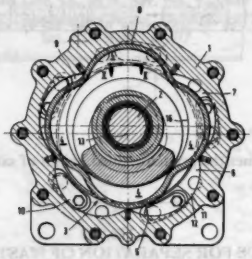
Claims priority, application Fed. Rep. of Germany, Mar. 6, 1978, 2809621

Int. Cl.³ F01C *19/00;* F04C *18/10*

U.S. Cl. 418—144 **2 Claims**

1. In an eccentric-rotor machine including a housing having a longitudinal axis and defining a plurality of work chambers; radial housing walls bounding the work chambers; a multi-lobe rotor arranged in the housing for orbital motion therein to sequentially and cyclically decrease and increase the volume of

each chamber in the execution of inward and outward strokes, respectively; the rotor having opposite radial rotor walls each defining a clearance with an adjacent respective radial housing wall; and sealing means arranged in the clearance for sealing the work chambers; the improvement wherein said sealing means comprises a sealing ring of circular course; said sealing ring being concentric to said axis and having a diameter such that in each chamber a length portion of said sealing ring is



situated externally of the outline of the rotor when the volume of the respective chamber is at a maximum, whereby said length portion is out of contact with the respective radial rotor wall during a terminal phase of the outward strokes and a beginning phase of the inward strokes of said rotor and said length portion is in contact with said respective radial rotor wall during a beginning phase of the inward strokes and a terminal phase of the outward strokes and a terminal phase of the inward strokes.

4,233,005

HYDRAULIC GEAR PUMP WITH RECESSES IN NON-WORKING GEAR FLANKS

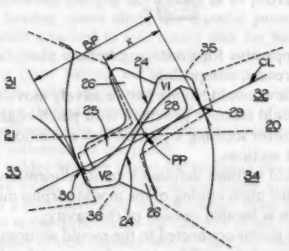
Harry S. Bottoms, Henley-in-Arden, and Ronald A. Heath, Birmingham, both of England, assignors to Lucas Industries Limited, Birmingham, England

Filed Dec. 28, 1978, Ser. No. 974,039

Claims priority, application United Kingdom, Jan. 18, 1978, 1997/78

Int. Cl.³ F04C *2/18, 15/00*

U.S. Cl. 418—190 **7 Claims**



1. A hydraulic pump comprising a housing, a pair of meshed externally-toothed gear elements in a chamber within the housing, said housing having inlet and outlet ports which communicate with said chamber on opposite sides of a zone in which said gear elements are in mesh, said housing including a bridge portion separating said inlet and outlet ports, the non-working flank of each gear tooth having recesses adjacent the end faces of the gear element and an unrecessed land extending from the root to the tip of the tooth between said recesses, adjacent pairs of contact points between said gears defining, together with said non-working flanks, an inter-tooth volume which includes said recesses and whose capacity changes as said gears rotate, each said inter-tooth volume comprising two volumes on respective sides of a minimum clearance between said non-working flanks, one of said two volumes increasing and the other of said two volumes decreasing after said minimum clearance has passed through the pitch point of the gears, said bridge portion providing means for co-operating with said tooth recesses so that said inlet and outlet ports intercommunicate through said inter-tooth volume at a time not later than that at which said minimum clearance passes through said pitch point, and said inter-tooth volume first communicates with said inlet port by way of said other volume.

4,233,006

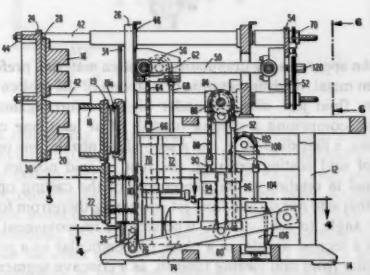
MACHINE FOR FORMING EXPANDED RESINOUS PRODUCTS

Walter Panas, Millville, N.J., assignor to Wheaton Industries, Millville, N.J.

Filed Oct. 10, 1978, Ser. No. 949,958

Int. Cl.³ B29D *27/00*

U.S. Cl. 425—4 R **25 Claims**



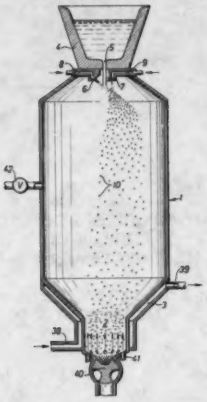
1. Apparatus for molding heat expandable cellular resin products comprising mating heated male and female molds and mating cooled male and female molds, said heated and said cooled male molds positioned on a first platen and said heated and said cooled female members positioned on a second platen, said platens including means for moving at least one of said platens toward and away from the other of said platens and thereby for opening and closing said mating molds, one of said platens further including mold transfer means for moving said heated mold mounted thereon from a first mold transfer limit position, in which said mating heated and mating cooled male and female molds face one another, to a second mold transfer limit position, in which said heated mold on said platen with mold transfer means is moved into a position facing said cooled mold on the opposite platen, the edges of said heated molds in said first mold transfer position remain slightly spaced from one another when said platens are in said mold closed position, one of said platens including movable heated mold mounting means adapted to be moved relative to said platen in the platen mold closure direction, after said platens are in the platen mold closed position, whereby the edges of said heated molds are brought into contact with one another, the cooled mold on said platen with mold transfer means including ejection means adapted to eject a cooled product retained thereon, said apparatus further including means for introducing heat expandable cellular resin into said heated male and female molds, upon engagement thereof.

4,233,007

APPARATUS FOR POWDER MANUFACTURE BY ATOMIZING A MOLTEN MATERIAL

Stig A. Karlsson, Tierp, Sweden, assignor to Uddeholms Aktiebolag, Hagfors, Sweden

Filed Dec. 17, 1975, Ser. No. 641,522
Claims priority, application Sweden, Dec. 18, 1974, 7415957
Int. Cl.[3] B22D *23/08*
U.S. Cl. 425—7 5 Claims



1. An apparatus for granulating a molten material, preferably molten metal, by disintegration of a stream of the molten material by fluid jets, directed under high pressure against said stream, comprising a casting tundish of at least one casting opening, a first slit nozzle, and a second slit nozzle, one on each side of said casting opening, the first of said nozzles being directed in relation to the center axis of the casting opening such that said nozzle and fluid jet emanating therefrom form an acute angle to said stream, wherein the improvement comprises a second nozzle, in a plane perpendicular to a pouring direction from said casting tundish, as a concave segment of a curve with the concave side of said nozzle facing the casting opening and directed essentially in the same direction as said casting opening and defining a concave segment of less than about 180°.

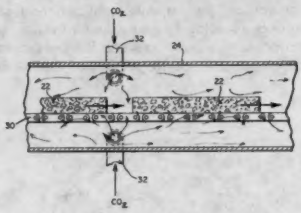
4,233,008

APPARATUS FOR THE MANUFACTURE OF CONCRETE PRODUCTS

John A. Murray, Norristown, Pa., assignor to U.S. Terrazzo Panels, Inc., Bryn Mawr, Pa.

Continuation of Ser. No. 817,263, Jul. 20, 1977, abandoned, which is a continuation of Ser. No. 468,566, May 9, 1974, abandoned, which is a continuation of Ser. No. 317,060, Dec. 20, 1972, abandoned, which is a division of Ser. No. 106,364, Jan. 14, 1971, abandoned. This application Jun. 29, 1978, Ser. No. 920,270
Int. Cl.[3] B29C *11/00*
U.S. Cl. 425—77 1 Claim

1. In an apparatus for manufacturing terrazzo concrete products from a moist mixture containing copolymeric additive and which mixture is compressed to form uncured free-standing shaped members of predetermined height and then cured in a dry atmosphere essentially consisting of carbon dioxide, a carbon dioxide chamber constructed to be relatively gas tight and having an entrance and an exit provided with flexible seal means adapted to allow passage of said shaped members while maintaining the carbon dioxide content of the atmosphere within said chamber to about at least 95%, the improvement which comprises the height of said chamber being in the range



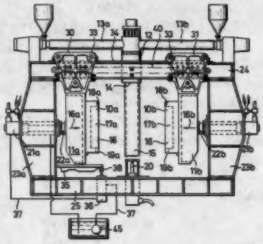
of 1½ to 4 times the predetermined height of said shaped members.

4,233,009

APPARATUS FOR SEPARATION OF WASTE MATERIAL FROM A MOULDED ARTICLE

Reinold Hagen, Bonn-Holzlar, Fed. Rep. of Germany, assignor to Kautex-Maschinenbau, GmbH, Bonn-Holzlar, Fed. Rep. of Germany

Division of Ser. No. 745,720, Nov. 29, 1976, Pat. No. 4,150,080. This application Aug. 31, 1978, Ser. No. 938,630
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1973, 2364510
Int. Cl.[2] B29C *17/07, 17/10*
U.S. Cl. 425—142 11 Claims



1. An apparatus for producing hollow plastic articles by a blowing process, comprising:

(a) a hollow mould having two relatively movable co-operable mould sections provided with pinch edges;

(b) means for locating a parison into a position between the mould sections,

said mould sections defining a cavity dimensioned in such a way that upon closing of the mould surplus material of the parison is located outside of the cavity;

(c) drive means connected to the mould sections for advancing the mould sections toward one another into engagement with the parison such that regions of the parison are pinched together and welded to each other by the pinch edges of the mould sections;

(d) means for admitting a compressed gas to the parison in the mould cavity for expanding the parison in the mould cavity;

(e) an energy supply; and

(f) control means connected to the energy supply and the drive means, said control means being operative to control the supply of energy from the energy source to the drive means, such that the supply of energy to the drive means is increased to thereby increase the speed at which the mould sections are advanced toward one another once the parison is substantially welded by the pinch edges, the

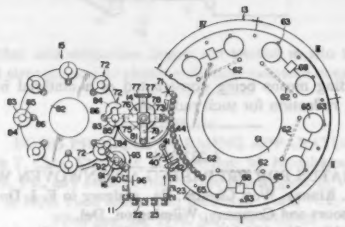
increased speed being sufficient to produce and at least partially sever the parison from the surplus material.

4,233,010

ORIENTATION-BLOW MOLDING EQUIPMENT

Sadao Suzuki, Tokyo, Japan, assignor to Yoshino Kogyosho Co. Ltd., Tokyo, Japan

Filed Dec. 26, 1978, Ser. No. 973,439
Claims priority, application Japan, Dec. 27, 1977, 52-159155
Int. Cl.[3] B29C *17/07*
U.S. Cl. 425—143 **10 Claims**



1. Equipment for producing biaxially oriented containers comprising:

a jig having a neck support which can hold the neck of a plastic piece positioned upside down, a mandrel provided beneath said neck support, and a core shaft for longitudinal orientation of said piece which is provided inside said mandrel so as to be freely movable upwardly or downwardly and which has a blow-molding air passage;

a core metal movable in a continuous path in a heating chamber, said core metal having a cylindrical holder, a hollow shaft freely rotatably supported at the center of said cylinder, a cylinder provided at the upper end of said shaft, a support holder extending from the top of said cylinder for supporting said mandrel of said jig, and a gear provided at the lower end of said shaft for transmitting a rotational motion;

said heating chamber having a rotary disk to which a plurality of said core metals are attached, said heating chamber being provided with several sets of heating elements and heat-exhausting damper devices so as to provide therein several heating zones along the transfer passage of said core metals attached to said rotary disk for heating stepwise said piece mounted on said jig;

a shielding plate having radial fins which are rotated in association with the movement of said core metal for preventing thermal atmosphere at the exit of said heating chamber from being suddenly disturbed and preventing a thermal influence on the piece;

a support holder braking means for stopping the rotation of said core metal, said braking means being provided at a position a predetermined distance apart from said shielding plate in the direction of the rotation of said rotary disk;

a mold loader which catches said jig holding the thermally processed piece for loading the same from the core metal which has stopped rotating by the action of said support holder braking means to a blow molding machine of rotary station type;

a means for rotating said jig while transferring said jig from said heating chamber to said molding machinery;

a blow molding machine of rotary station type having a plurality of molds and provided beneath said molds with a cylinder rod for pushing upwardly said orienting core shaft of said jig placed in each said mold and for introducing compressed air into the same;

a mechanism for pushing up said core shaft;

an unloading means for taking out said jig from said mold placed at the final station of said blow molding machine;

a conveyor having a plurality of attachment hooks for removing the jig from said unloading means to release the molded container from said jig and for catching the mandrel of the thus released jig to mount a new piece thereonto; and

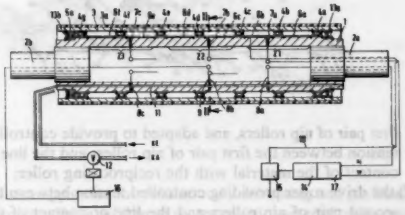
a transfer apparatus provided at a corner of said conveyor for mounting said jig which has advanced to said corner onto the core metal positioned at the entrance of said heating chamber.

4,233,011

ROLLS OF CONTROLLABLE FLEXURE, ESPECIALLY FOR MACHINES FOR THE PRODUCTION AND PROCESSING OF WEBS OF PAPER OR PLASTIC

Walter Bolender, Erkrath, and Ernst Wallner, Langenfeld, both of Fed. Rep. of Germany, assignors to ER-WE-PA Maschinenfabrik & Eisengiesserei, Ekrath, Fed. Rep. of Germany

Filed Aug. 24, 1979, Ser. No. 69,660
Claims priority, application Fed. Rep. of Germany, Aug. 31, 1978, 2837913
Int. Cl.[2] B30B *15/14, 3/04;* B29D *7/14*
U.S. Cl. 425—143 **11 Claims**



1. A roll having controllable flexure comprising: a substantially cylindrical inner element; a tubular outer member configured to extend over a portion of the length of the inner member and surrounding same; means mounting the outer member on the inner member for rotation about the cylindrical axis of the inner member; and means for producing forces acting radially between the inner member and outer member along a generatrix comprising at least one electrically powered heating element disposed on the inner element and extending over at least a portion of the axial length of the inner element and over a given circumferential area that is smaller than 180° to produce a temperature differential therein and a corresponding flexure in response thereto, at least one means for sensing the temperature difference between the portion of the inner member at said at least one heating element and the portion of the inner member diametrically opposite thereto and means for regulating the temperature differential at a selected value for said at least one heating element to obtain a corresponding degree of flexure of the inner member and thereby the outer member.

4,233,012

BIAS STRETCHING APPARATUS FOR IMITATION-LEATHER

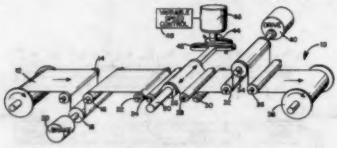
Charles M. Willwerth, Newburyport, and John P. Silvia, Tewksbury, both of Mass., assignors to Compo Industries, Inc., Waltham, Mass.

Division of Ser. No. 810,920, Jun. 29, 1977, Pat. No. 4,140,827. This application May 3, 1978, Ser. No. 902,568
Int. Cl.[3] B29C *17/02*
U.S. Cl. 425—162 **10 Claims**

10. An apparatus for the diagonal-bias-stretching under tension of a continuously moving laminate material containing a grain-design effect thereon, which apparatus comprises:

(a) a source of laminate material which comprises a fibrous woven base sheet, a coated polymeric layer and a discontinuous polymeric layer to define a raised surface-design effect thereon;

(b) a driving roller to unwind the laminate material from a source and to advance the unwound material continuously under tension from the source along a longitudinal line of advance through a series of rollers;
(c) at least one elastomer-coated, smooth-surface, reciprocating roller disposed in the line of advance of the sheet material whose surface is in contact with the base layer of the sheet material along a line of contact generally perpendicular to the continuously moving line;
(d) a first pair of elastomer-coated nip rollers on one side and a second pair of elastomer-coated nip rollers on the other side of the reciprocating roller, and spaced apart from the reciprocating roller a controlled distance, the first and second pair of nip rollers disposed in the line of advance of the sheet material and generally parallel to the reciprocating roller, and having a line of contact with the material just before or just after the reciprocating roller, which is generally perpendicular to the line of advance;
(e) a hold-back roller with braking means upstream of the



first pair of nip rollers, and adapted to provide controlled tension between the first pair of nip rollers and the line of contact of the material with the reciprocating roller;
(f) the drive roller providing controlled tension between the second pair of nip rollers and the line of contact of the material leaving the reciprocating roller;
(g) a wind-up roller whereby material processed through the apparatus is wound up after processing;
(h) means to reciprocate the reciprocating roller in a direction generally normal to the line of advance between positions from either side of the line of advance, while the first and second pair of nip rollers retain the material in the line of advance, to provide for diagonal bias-stretching of the material as it moves along the line of advance; and
(i) means to control the frequency of movement of the reciprocating roller and the length of the stroke of the reciprocating roller, thereby providing an apparatus which stretches and relaxes the laminate material as it advances under tension to enhance the surface-design effect thereon and to improve the hand of the material.

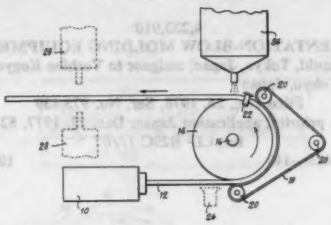
4,233,013

APPARATUS FOR PRODUCING CONTINUOUS CURED RUBBER STRIPS

Georg G. A. Böhm, Akron, and William W. Barbin, Massillon, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 641,150, Dec. 15, 1975, Pat. No. 4,122,137. This application May 16, 1978, Ser. No. 906,575
Int. Cl.[3] B29H *5/04*
U.S. Cl. 425—174.4 **11 Claims**

1. Apparatus for the continuous production of cured rubber strips having a surface design comprising:
(a) means for extruding rubber into a soft, viscous continuous rubber strip;
(b) moving molding means having the selected design formed in recesses on its surface for continuously receiving the soft, viscous rubber strip;
(c) means for forcing the rubber into said recesses under pressure;
(d) means for directing a beam of high energy ionizing radiation into the viscous rubber while maintaining it under pressure in the recesses to completely cure the rubber; and
(e) means for removing the cured rubber strip from the recesses;



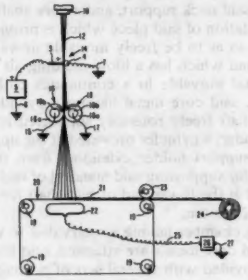
said molding means being constructed of a material having minimum reflection for such radiation.

4,233,014

APPARATUS FOR PREPARING A NONWOVEN WEB

George A. Kinney, West Chester, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 956,348, Oct. 31, 1978. This application Sep. 19, 1979, Ser. No. 77,034
Int. Cl.[3] B29H *5/24*
U.S. Cl. 425—174.8 R **2 Claims**



1. In an apparatus for preparing a uniform nonwoven web from a continuous bundle of untwisted filaments that includes means for continuously providing the bundle, means for applying an electrostatic charge to the filaments of the bundle and a collecting surface for the charged filaments, the improvement comprising: a pair of contiguous counter rotating elastomer-covered electrically grounded rolls having contacting surfaces located between said means for applying an electrostatic charge and the collecting surface, said rolls forming a nip through which the charged filaments are passed toward said collecting surface; and means for generating an electrostatic field between said rolls and said collecting surface.

4,233,015

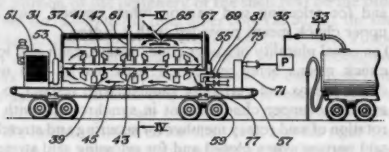
EMPLOYING QUICKLIME IN STABILIZING EARTH

Joe D. Teague, 4813 Black Oak La., Fort Worth, Tex. 76114, and Paul J. Wright, 1207 Sotogrande Blvd., Apt. 315, Euless, Tex. 76039

Filed Dec. 14, 1978, Ser. No. 969,421
Int. Cl.[2] E02D *3/14*
U.S. Cl. 405—263 **11 Claims**

1. A method of treating subsurface layers of earth for controlling movement of subsurface water and building strength of the subsurface layers comprising the steps of:
a. admixing in a slurry mixing tank unslaked lime called quicklime and water to form a hot hydrated lime slurry at elevated temperature above ambient temperature; and

b. injecting said hot lime slurry before cooling below ambient temperature and at an elevated temperature above ambient at a plurality of predetermined, spaced apart locations and at a plurality of depths



such that said subsurface layers are treated in situ to obtain added strength and to obtain stabilized moisture content.

4,233,016

FOOD PRODUCT FORMING APPARATUS

Joseph T. Chin, Elmhurst, N.Y.; Arthur M. Hochhauser, Allentown, Pa., and John P. McCarthy, Huntington, N.Y., assignors to DCA Food Industries, Inc., New York, N.Y.

Filed Sep. 28, 1978, Ser. No. 946,755
Int. Cl.[3] A21C 5/00
U.S. Cl. 425—288 **9 Claims**

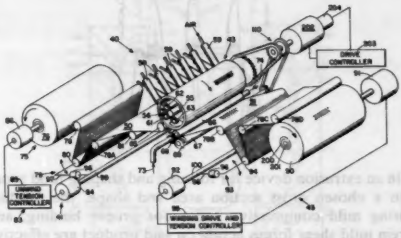
1. In a food product apparatus of the type which includes a nozzle having an axial bore extending longitudinally therethrough for conducting a slurry of said food product delivered at one end of said nozzle to an opening at the other end of said nozzle, said opening being constructed and arranged for radially outwardly discharging given amounts of said slurry, the improvement comprising a forming device constructed and arranged in spaced-apart relationship with said nozzle, said device having an inner wall the axis of which is aligned with the axis of said nozzle for forming corresponding outside walls on the exteriors of each of said given amounts of discharged slurry to form said food product, said inner wall radially spaced from and confronting said opening to define a region adjacent said opening and extending radially outwardly from said opening toward said inner wall, said inner wall being constructed and arranged so that said region is substantially unobstructed in a direction parallel to said wall both axially above and below said opening, wherein each given amount of discharged slurry is substantially entirely connected within said region when said outside wall is formed thereon, said food product being free to be removed from both said nozzle and said device in said parallel direction.

4,233,017

APPARATUS FOR DEBOSSING AND PERFORATING A RUNNING RIBBON OF THERMOPLASTIC FILM

Malcolm B. Lucas, and Robert H. Van Coney, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 733,961, Oct. 19, 1976, Pat. No. 4,151,240. This application Jan. 25, 1979, Ser. No. 6,950
Int. Cl.[3] A21C 11/10
U.S. Cl. 425—290 **2 Claims**



1. An apparatus for continuously debossing and perforating a running ribbon of film of thermoplastic material, said apparatus comprising:

a frame;

a debossing-perforating cylinder having a perforated tubular wall having a multiplicity of radially inwardly tapered holes through it;

means for rotating said cylinder on its axis of gyration;

means for forwarding a smooth running ribbon of thermoplastic film onto said tubular wall of said cylinder at a first location fixed with respect to said frame;

means for forwarding said running ribbon of film from said cylinder at a second location fixed with respect to said frame which second location is circumferentially spaced from said first location;

vacuum means for maintaining substantially constant predetermined levels of tension in said film being forwarded onto and from said cylinder;

means for sufficiently isolating a portion of said film running intermediate said first and said second locations from said levels of tension by means for applying a vacuum to said portion of film so that said portion of film can be heated to above its thermoplastic temperature without having it macroscopically distended;

means for sufficiently heating said portion of film and subjecting it to a sufficient radially inwardly directed pneumatic differential pressure to cause said sector of film to be debossed and perforated sufficiently to assume the image of the pattern of the radially outwardly facing surface of said perforated tubular wall and to form tapered capillaries of the film material in the holes of the perforated tubular wall; and

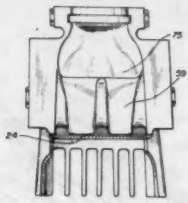
means for sufficiently cooling said portion of film before it reaches said second location to cause the debossing and perforations to be set in said film, and to enable said predetermined level of tension to be applied to said film by means for applying a vacuum to said film, said film being forwarded from said cylinder without causing said film to be substantially distended in the machine direction.

4,233,018

EGG ROLL EXTRUSION AND HANDLING APPARATUS

Dennis L. Chinfen, 58 Pellan Crescent, Kanata, Ottawa, Ontario, Canada

Continuation of Ser. No. 771,459, Feb. 24, 1977, abandoned. This application Aug. 1, 1978, Ser. No. 930,060
Claims priority, application Canada, Feb. 27, 1976, 246749
Int. Cl.³ B29F *3/06*; A21C *11/10*
U.S. Cl. 425—297 **13 Claims**



1. In an extrusion device for forming and shaping food product to a chosen cross section area and shape, the product requiring mild compressive action for proper binding, and wherein mild shear forces acting on said product are effective to cause separation, breakup and damage to said product affecting said proper binding, said device include a housing and means for forcing such food product through said housing,

means in said housing which comprises,

means defining a first section having an inlet receiving a flow of food product forced into said housing by said forcing means and having an exit region of a first predetermined cross section area and shape, said first section means initially shaping the cross section of said flow to conform to said first predetermined cross section area and shape,

and means defining a stabilizing section having an inlet smoothly continuously transitioning from the exit region of said first section and having an outlet of second cross section area and shape corresponding to said chosen cross section area and shape for said food product,

said inlet of said stabilizing section having a cross section corresponding to said first cross section area and shape, whereby said food product exits said first section and smoothly enters said stabilizing section, said first cross section area being up to about 15% greater than said second cross section area at said outlet, and said stabilizing section comprising a defined longitudinal passage whose dimensions transverse to the longitudinal direction of said passage do not increase from said inlet of said stabilizing section to said outlet,

whereby said first section delivers said product to said stabilizing section as a continuous even flow and alters the cross section of flow of said food product from said first predetermined cross section area and shape to said chosen cross section area and shape as said product passes through said stabilizing section to said outlet and proper binding of said product is effected.

4,233,019

APPARATUS FOR DELIVERING PARISONS OF PRESELECTED LENGTH AND DIAMETER

Yuji Sawa, and Sigeru Endo, both of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 14, 1978, Ser. No. 933,404
Claims priority, application Japan, Aug. 24, 1977, 52-100566
Int. Cl.³ B29C *17/07*, *17/16*
U.S. Cl. 425—305.1 **7 Claims**

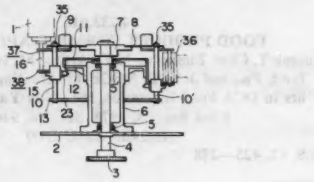
1. An apparatus for delivering a parison from a die of an extruder to a molding means comprising:

(a) a rotary member supported by a rotation shaft, said rotary member being rotated in a horizontal plane between said die and said molding means by rotation of said rotary shaft;

(b) a plurality of upper chuck means disposed around the circumference of said rotary member for cutting and securing said parison extruded from said die when closed and for releasing said parison when opened, each said upper chuck means provided with a cutter;

(c) an equal plurality of lower chuck means, each said lower chuck means being associated with one of said upper chuck means and vertically slidable with respect to said associated upper chuck means in synchronism with said rotation of said rotary member for securing and stretching said parison when closed and for releasing said stretched parison when opened;

(d) a stationary cylindrical guide cam member adjacent said rotary shaft and in rotational contact with each said lower chuck means for causing each said lower chuck means to



move away from each associated upper chuck means as each said associated lower chuck means and upper chuck means are rotated by said rotary member between said die and said molding means; and

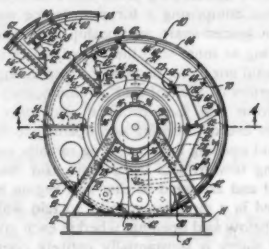
(e) said rotary member including an upper plate fixed to said rotary shaft, a lower ring-like plate disposed around said rotary shaft, a plurality of pairs of guide shafts disposed between said upper and lower plates for slidingly supporting said lower chuck means for movement toward and away from said upper chuck means, an equal plurality of rotatable spline shafts disposed between said upper and lower plates, each of said rotatable spline shafts disposed between said upper and lower plates, each of said rotatable spline shafts being adjacent an associated pair of said guide shafts and coupled to the upper and lower chuck means supported by said associated pair of guide shafts, and means for rotating said spline shafts to open and close said upper and lower chuck means.

4,233,020

COLLAPSIBLE MANDREL

Leo A. Oswald, Huntingdon, Pa., assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Mar. 13, 1979, Ser. No. 20,122
Int. Cl.³ B29C *13/04*
U.S. Cl. 425—471 **5 Claims**



1. A rotatable collapsible mandrel (10) useful in the production of cylindrical fluid retaining walls of thermosetting resin

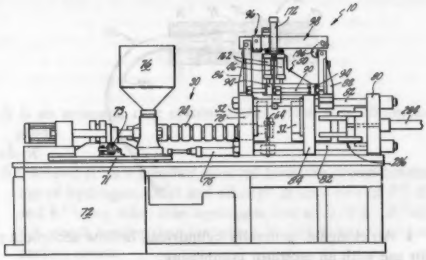
and glass fiber reinforcing material, the mandrel (10) comprising a rigid inner core (28, 30, 32) rotatable about a horizontal axis, a tubular steel shell (44) having a longitudinal slit (x—x) to permit collapsing thereof by flexure of a portion on one side of the slit (x—x) radially inwardly, means (50) rigidly connecting a minor portion of the periphery of the shell (44) on the other side of the slit (x—x) to the rigid inner core (28,30,32), the shell (44) being flexible on the one side of the slit (x—x) over a major portion of its periphery, and a plurality of rows of support members (57, 58), the support members of each row being aligned axially of the shell (44) and being pivotally connected at one end to the rigid inner core (28, 30, 32) and at the other end to the flexible portion of the shell (44), and the rigid inner core (28, 30, 32) being rotatably supported on the inside from only one end and the other end being free for removal of a fluid retaining wall formed on the shell (44).

4,233,021

PLASTIC BOTTLE FORMING MACHINE

Robert Spurr, West Hartford, Conn., assignor to Emhart Industries, Inc., Farmington, Conn.

Filed Mar. 30, 1978, Ser. No. 891,859
Int. Cl.[2] B29C *17/07*
U.S. Cl. 425—525 **19 Claims**



1. A hollow article molding machine comprising a split parison mold; core rod means for removable insertion into said parison mold to form a parison cavity; means for injecting a moldable material into said parison cavity; blow mold means; blow head means for removable engagement with said blow mold; means for moving said core rod means into and out of said parison mold; means for moving said blow head means into and out of engagement with said blow mold; a pair of split neck rings; a support carrying said neck rings; means for moving said neck ring support for alternating cooperation of said neck rings with said parison mold and said blow mold and for transferring a molded parison from said parison mold to said blow mold; a first platen carrying at least one parison mold half and at least one blow mold half in side-by-side relation; a second platen carrying the other parison mold half and the other blow mold half in mirror image side-by-side relation; means mounting said platens for relative movement to open and close said molds in unison; and mounting means positioned between said platens mounting said core rod means; blow head means; and means for moving core rod means and blow head means.

4,233,022

APPARATUS FOR FORMING HEAT TREATED BLOWN THERMOPLASTIC ARTICLES

Thomas E. Brady, Sylvania, and Santos W. Go, Toledo, both of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

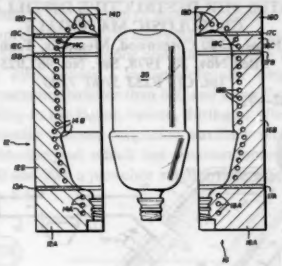
Division of Ser. No. 824,389, Aug. 15, 1977, abandoned. This application Jul. 10, 1978, Ser. No. 922,931
Int. Cl.[3] B29C *17/07, 25/00*
U.S. Cl. 425—525 **1 Claim**

1. An apparatus for heat treating a blown oriented thermoplastic article in a final blow mold, comprising:

a final blow mold comprising sectional members which cooperatively define an interior cavity having a longitudinal axis and essentially conforming to the size and shape of a final blown thermoplastic article that is a hollow container having a neck, a blown body portion, a bottom, and an annular heel integrally interconnecting the bottom and the body;

means to provide the thermoplastic material between the blow mold for blowing at its orientation temperature;

each sectional member including at least four thermally segregated portions corresponding to said bottle portions along a longitudinal axis of the cavity, thermal insulation layers separating each sectional member portion from the adjacent sectional member portion;



means to blow the material to the final container shape and means for applying a fluid pressure to the interior of the article while the article is heat treated;

heating means to heat treat parts of the final article in thhe sectional member by heating the annular oriented body and heel bottle portions, said heating means including internal fluid ducts within those sectional member portions corresponding to the body and heel bottle portions and means for supplying heated fluid to said internal ducts,

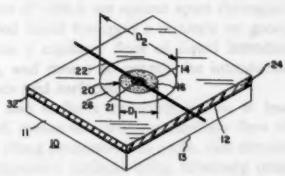
wherein the neck and bottom portions of said sectional members include internal fluid ducts, and means for supplying coolant fluid to the internal ducts of the neck portion.

4,233,023

PHOTOFLASH LAMP HAVING EXPANDABLE BURNING VOLUME

Peter D. Johnson, Schenectady, and Charles E. Jones, Clifton Park, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Nov. 8, 1978, Ser. No. 958,653
Int. Cl.[3] F21K *5/00*
U.S. Cl. 431—362 **14 Claims**



1. A photoflash lamp for providing an expandable volume to accommodate oxygen and reaction products generated upon combustion of a combustible mixture contained therein, comprising:

(a) plate means having a substantially flat surface on each

side and one of said sides having a recess medially disposed therein;

(b) a combustible mixture substantially filling said recess;

(c) primer means overlying said plate surface and centrally disposed in the opening of said recess for igniting said combustible mixture; and

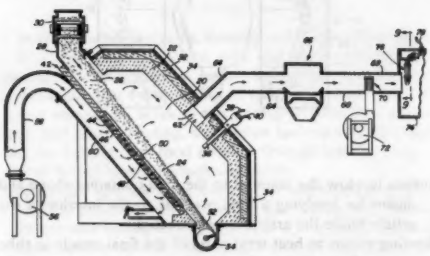
(d) transparent, substantially flat plate expandable sealing means formed over said recess and affixed to said plate means surface for confining said combustible mixture within said recess, said sealing means expanding during combustion of said combustible mixture so as to define a volume between said sealing means and said plate means greater than the volume of said recess.

4,233,024

APPARATUS FOR DESTRUCTIVE DISTILLATION OF CELLULOSIC MATERIALS

Vernon F. Plass, 6320 Coteswood, Memphis, Tenn. 38134

Filed Nov. 20, 1978, Ser. No. 961,925
Int. Cl.[3] F23J 5/00, 7/00
U.S. Cl. 432—72 **13 Claims**



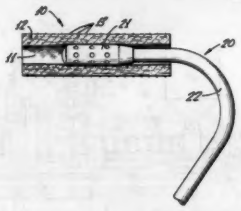
9. A refractory gas production chamber for partial combustion of cellulosic material to produce combustible gases, comprising; feed means for introducing the cellulosic material, support means for supporting the cellulosic material, forced primary air means for controllably introducing primary air into the gas production chamber, and duct means for withdrawing the gases from the gas production chamber, said support means comprising an inclined support chute extending at an angle from the top to the bottom of said gas production chamber, the chute having a bottom surface in the form of a flat grate perforated for controllable passage therethrough of said primary air from the forced primary air means, the gas production chamber further including at the lower exit of said chute removal means for continuous withdrawal of non-destroyed cellulosic material propelled thereinto by said primary air, and igniting means for maintaining partial combustion in the said gas production chamber, said perforated grate being made from a refractory composition interlaced with metallic needles.

4,233,025

HOLLOW COTTON ROLL

William A. Larson, 1215 Paseo Dorado, Fullerton, Calif. 92631, and Dale P. Wilterink, 1645 W. Cris Ave., Anaheim, Calif. 92802

Filed Mar. 8, 1979, Ser. No. 18,782
Int. Cl.[3] A61C 5/14, 17/04
U.S. Cl. 433—136 **16 Claims**



1. An elongate, generally cylindrical, hollow absorbent roll for use with an aspirator comprising:

a layer of an open mesh fabric defining an inner wall of said roll, said aspirator being insertable within said fabric;

a layer of an absorbent material surrounding said fabric layer; and

a layer of braided yarn surrounding said absorbent material to retain same.

4,233,026

REDUCING GRINDING TIME AND COMPOSITIONS THEREFOR

Gerhard Hitschfel, Niedernhausen; Peter Jürges, Eppstein, and Rudolf Munk, Floersheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 862,581, Dec. 20, 1977, abandoned. This application Jul. 17, 1979, Ser. No. 58,293

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1976, 2657774

Int. Cl.³ D06M *13/18*; D06P *1/16, 1/60*; C09K *11/02*

U.S. Cl. 8—52 28 Claims

1. A substantially homogeneous ground composition which, in water-free form, consists essentially of two components: (A) a sparingly-soluble or insoluble dyestuff and (B) from 0.5 to 50 percent by weight of the composition of at least one water-soluble non-ionic compound of the formula

Y-O-Z-H (I)

wherein

Y is

X is an aromatic ring system having from 6 to 10 carbon atoms;

each of

R^1, R^2 and R^3 is a member selected from the group consisting of hydrogen, alkyl and alkenyl, at least one of R^1, R^2 and R^3 being other than hydrogen, and each of R^1, R^2 and R^3, which is other than hydrogen, having from one to four carbon atoms;

Z represents a member selected from the group consisting of $(C_2H_4O)_m$, $(C_3H_6O)_n$ and a combination thereof; and

each of

m and n represents an integer from 2 to 15.

4,233,027

METHOD FOR PRINTING AND FLOCKING FABRICS SIMULTANEOUSLY

Rafael P. Albero, Plaza del Pintor Gisbert, num. 2, Alcoy (Alicante), Spain

Filed May 1, 1978, Ser. No. 901,500

Claims priority, application Spain, Jan. 28, 1978, 466.438

Int. Cl.³ D06P *5/00, 7/00*

U.S. Cl. 8—488 3 Claims

1. A method for printing and flocking a fabric which comprises the steps of moving the fabric along a path; applying dye to the fabric in accordance with a printing pattern to print such pattern directly on the fabric itself without interrupting the moving thereof; applying adhesive over regions of the fabric to be flocked without interrupting the moving of the fabric; and, applying flocking material to said regions of the fabric without interrupting the moving thereof.

4,233,028

PROCESS FOR THE LEVEL DYEING OF POLYACRYLONITRILE MATERIALS OF SLOW, NORMAL AND RAPID ABSORPTIVE CAPACITY

Josef Koller, Reinach; Ulrich Horn, Basel; Peter Moser, Binningen; Manfred Motter, Aesch, all of Switzerland, and Pierre Galafassi, Rixheim, France, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 703,864, Jul. 9, 1976, abandoned. This application Jan. 24, 1978, Ser. No. 871,918

Claims priority, application Switzerland, Jul. 14, 1975, 9168/75

Int. Cl.³ D06P *1/41, 5/00, 3/76*

U.S. Cl. 8—534 21 Claims

1. A process for dyeing polyacrylonitrile material in level shades, regardless of the absorptive capacity of the polyacrylonitrile material, in the absence of inorganic electrolytes, which process comprises the steps of applying to the polyacrylonitrile material an aqueous dye liquor containing at least two migrating cationic dyes having a cation-molecular weight smaller than 275, a parachor smaller than 680 and a log P smaller than 2.8, and adding to the liquor, before, during or after dyeing, at least one organic cationic migration auxiliary which is not a migrating retarder and which has a cation-molecular weight between 100 and 200, a parachor smaller than 620 and a log P smaller than 5.4.

4,233,029

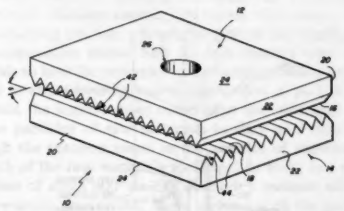
LIQUID TRANSPORT DEVICE AND METHOD

Richard L. Columbus, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 25, 1978, Ser. No. 954,689

Int. Cl.² G01N *31/00*

U.S. Cl. 23—230 R 33 Claims



1. A liquid transport device for controlled fluid flow comprising

two fixedly mounted opposing surface areas substantially all portions of which are spaced apart throughout a zone of intended liquid transport a distance no greater than will maintain a capillary flow of liquid introduced therebetween, and means to permit the introduction of liquid between said surfaces,

each of said surfaces including, across at least a portion thereof, means for directing capillary flow of introduced liquid along predetermined paths, said directing means on the respective surfaces being relatively oriented so that the paths directed by a substantial portion of one of said surfaces form positive angles with respect to the paths directed by the directly opposing portion of the other surface,

whereby capillary flow of liquid between said surfaces occurs in a controlled multidirectional manner with a predetermined peripheral configuration.

4,233,030
METHODS AND APPARATUS FOR LIQUID CHROMATOGRAPHY

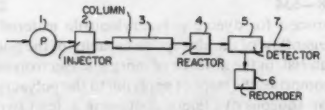
Peter J. Twitchett, Lapworth, and Peter L. Williams, Basingstoke, both of England, assignors to National Research Development Corporation, London, England

Filed Mar. 6, 1978, Ser. No. 884,621

Claims priority, application United Kingdom, Mar. 8, 1977, 9678/77; Apr. 27, 1977, 17633/77

Int. Cl.[2] **G01N** *31/08, 33/16, 21/38;* **G01J** *1/10*

U.S. Cl. 23—230 R **17 Claims**



1. A method of high pressure liquid chromatography wherein the eluent from a chromatographic column enters a detector adapted to detect a known or suspected constituent by means of an optical property, wherein the eluent while flowing between the column and the detector is irradiated in order to convert the constituent photochemically to a species which possesses this property or in which said property is changed in magnitude to a substantial degree.

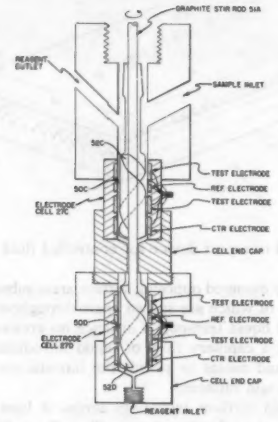
4,233,031
ELECTROCHEMICAL TESTING SYSTEM AND METHOD

Wayne R. Matson, Ayer, and Ronald Vitukevich, Everett, both of Mass., assignors to Environmental Sciences Associates, Inc., Bedford, Mass.

Continuation-in-part of Ser. No. 868,654, Jan. 11, 1978, abandoned. This application Dec. 11, 1978, Ser. No. 968,060

Int. Cl.[3] **G01N** *27/30, 33/48, 33/50*

U.S. Cl. 23—230 B **44 Claims**



1. In serum iron testing, a method of electrochemical testing compatible with micro sized samples of serum comprising:

preparing a substantially iron-free matrix including a lower aliphatic alcohol and between about 5½ Formal and about 8½ Formal HCl;

introducing a predetermined quantity of serum into said matrix to provide an electrolytic sample, and adding a measured quantity of said sample containing a measured quantity of serum to an electrolytic cell;

applying to a first electrode in said cell a potential to measure the quantity of copper and iron in said cell;

applying to a second electrode in said cell a potential to measure a different quantity selected from copper and iron;

obtaining signals corresponding to current flow at each of said electrodes; and

comparing said signals to measure the quantity of iron.

4,233,032
FETAL LUNG MATURITY TEST

Bernard E. Statland, Sacramento, Calif., and Geoffrey Sher, Reno, Nev., assignors to University of North Carolina at Chapel Hill, Chapel Hill, N.C.

Filed Feb. 12, 1979, Ser. No. 11,253

Int. Cl.[3] **G01N** *33/48, 13/00*

U.S. Cl. 23—230 B **6 Claims**

1. A method for measuring fetal or neonatal lung maturity employing amniotic fluid comprising:

combining a predetermined volume of amniotic fluid with graduated amounts of 95% aqueous ethanol to 100% ethanol to provide at least six mixtures of graduated ethanol volume fractions from 0.45 to 0.50 to 0.01 graduations;

agitating each of the mixtures in substantially the same manner; and

determining the highest ethanol volume fraction which results in a persistent foam at the interface;

wherein an ethanol volume fraction of greater than 0.45 with persistent foam indicates fetal lung maturity.

4. A kit for use in the method according to claim **1**, containing six vials, each of the vials containing different amounts of 95% aqueous ethanol to 100% ethanol, so that upon admixture with a fixed amount of amniotic fluid, the vials provide ethanol volume fractions ranging from 0.45 to 0.50 at 0.01 graduations.

4,233,033
METHOD AND APPARATUS FOR MEASURING THE O_2 CONTENT OF A GAS

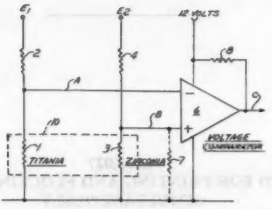
Raymond J. Eifler, Farmington Hills; Walter F. Datwyler, Jr., Royal Oak, both of Mich., assignors to Bendix Autolite Corporation, Fostoria, Ohio

Autolite Corporation, Fostoria, Ohio

Filed Sep. 19, 1979, Ser. No. 76,881

Int. Cl.[3] **G01N** *27/04*

U.S. Cl. 23—232 E **21 Claims**



1. A method for obtaining an electrical signal which is a function of the oxygen content in an exhaust gas of an internal combustion engine, the method comprising:

connecting a first resistor comprised of titania in series with a second resistor having a predetermined resistance;

connecting a third resistor comprised of stabilized zirconia in series with a fourth resistor having a predetermined resistance;

connecting the first and second resistors in parallel relationship with the third and fourth resistors;

applying a potential across the resistors;

exposing said resistors to the exhaust gas an internal combustion engine;

obtaining a first electrical signal which is a function of the first and second resistors; and

obtaining a second electrical signal which is a function of said third and fourth resistors.

4,233,034

DESULFURIZATION OF COAL

J. Wayne Miller, Yorba Linda, Calif., and Mark J. Anderson, St. Paul, Minn., assignors to Union Oil Company of California, Brea, Calif.

Filed May 3, 1979, Ser. No. 35,436

Int. Cl.[3] C10L 9/02; C10B 57/00

U.S. Cl. 44—1 SR 31 Claims

1. A process for desulfurizing coal and other carbonaceous materials which contain pyritic sulfur, organic sulfur and sulfate sulfur which comprises: contacting an aqueous slurry of said coal or carbonaceous material with a transition metal salt, hydrogen and a buffer that buffers within the pH range of from about 4 to about 10 under reaction conditions; and contacting said coal or carbonaceous material with an acid.

17. A process for desulfurizing coal and other carbonaceous materials which contain pyritic sulfur, organic sulfur and sulfate sulfur which comprises contacting an aqueous slurry of said coal or carbonaceous material, a transition metal salt, hydrogen, and a buffer that buffers within the pH range of from about 4 to about 10 at a temperature of from about 200° F. to about 450° F. and a pressure of from about 100 psig to about 4000 psig, for about 30 minutes to about 5 hours, raising the temperature from about 450° F. to about 700° F. for about 30 minutes to about 25 hours; and contacting said coal or carbonaceous material with an acid.

4,233,035

ADDITIVES FOR AVIATION AND SIMILAR FUELS

Edward A. Allen, Havant; Peter C. Phillips, Emsworth, and Terence Smithson, Southsea, all of England, assignors to National Research Development Corporation, London, England

Continuation of Ser. No. 777,684, Mar. 15, 1977, abandoned. This application Jul. 14, 1978, Ser. No. 924,718

Claims priority, application United Kingdom, Mar. 17, 1976, 10834/76

Int. Cl.[2] C10L 1/22

U.S. Cl. 44—73 14 Claims

1. A hydrocarbon fuel containing a metal de-activator which is a hydroxy oxime having the formula

$$R^1-\underset{\underset{NOR^3}{\|}}{C}-R^2$$

wherein R^1 represents an alkyl group or a benzenoid aromatic group, R^2 represents an orthohydroxy benzenoid aromatic group or an α-hydroxy group having the formula

$$-\underset{\underset{OH}{|}}{CH}-R^4$$

wherein R^4 represents an alkyl or benzenoid aromatic group; and R^3 represents a hydrogen atom or an alkyl group.

4,233,036

PROCESS FOR PREVENTING ADHESION OR CAKING OF COAL

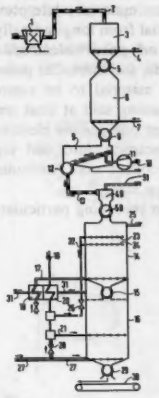
Christian Koch, and Alfred E. Behrmann, both of Erlangen, Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim, Fed. Rep. of Germany

Filed Mar. 7, 1979, Ser. No. 18,410

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1978, 2813765

Int. Cl.[3] C10J 3/06; C10L 9/04

U.S. Cl. 48—210 2 Claims



1. In a method of preventing adhesion or caking of solid hydrocarbon-containing raw materials comprising coal which in the presence of hydrogen are partially gasified by hydrogenation gasification in a reaction vessel through which the raw material passes while being heated to a temperature above 700° K., which comprises passing raw materials in particle form downwardly through the reaction vessel, introducing a hydrogen-containing gas into a lower portion of the reaction vessel at a temperature above 700° K. into contact with the raw materials to heat the raw materials to a temperature above 700° K. and to effect hydrogenation gasification of part of the raw materials, the improvement comprising intermittently contacting the particles of raw materials as they pass downwardly through the reaction vessel in the absence of impediments in the path of the raw materials to deflect its flow, in a temperature zone of about 600° to 700° K. with a medium which is at a temperature above 1000° K. in contact with the particles to rapidly heat the surfaces of the raw material particles to above 700° K. by direct contact with the hot medium alone, in the absence of combustion of raw materials with added oxygen to cause the raw material particles to become non-caking in its downward passage through the reaction vessel at a temperature above 700° K.

4,233,037

METHOD OF AND APPARATUS FOR REDUCING BACK CORONA EFFECTS

Duane H. Pontius, Birmingham, and Wallace B. Smith, Trussville, both of Ala., assignors to The United States of America as represented by the Administrator U.S. Environmental Protection Agency, Washington, D.C.

Continuation of Ser. No. 882,673, Mar. 2, 1978, abandoned. This application Jul. 13, 1979, Ser. No. 57,163

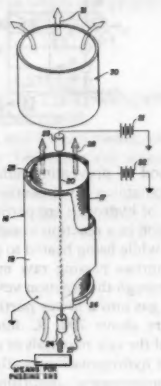
Int. Cl.[3] B03C 3/08, 3/40

U.S. Cl. 55—2 8 Claims

1. A method of removing particulate material from gas using a charging stage and a separate electrostatic collecting stage while reducing back corona effects in the charging stage, the

method comprising providing in said charging stage an ion field of given polarity between at least one corona discharge electrode and at least one passive electrode in said charging stage, removing ions of opposite polarity which may result from back corona discharge from said at least one passive electrode by capturing the ions of opposite polarity with at least one intermediate, apertured electrode positioned between said at least one corona discharge electrode and said at least one passive electrode, passing gas containing particulate material to be removed substantially longitudinally through the space between said at least one intermediate, apertured electrode and said at least one corona discharge electrode to charge said particulate material while preventing gas containing particulate material from longitudinally entering the space between said at least one passive electrode and said at least one intermediate electrode, and thereafter passing said gas containing said particulate material to be removed out from said charging stage containing said at least one corona discharge electrode, said at least one passive electrode and said at least one intermediate electrode, into said separate electrostatic collecting stage to collect said particulate material in said electrostatic collection stage.

4. An apparatus for removing particulate material from gas



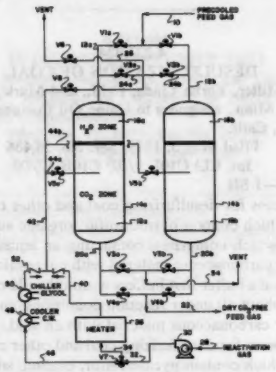
using a charging stage and a separate electrostatic collection stage while reducing back corona effects, the apparatus comprising said charging stage, said charging stage having at least one passive electrode, at least one corona electrode spaced from said at least one passive electrode and at least one apertured intermediate electrode positioned between said at least one corona electrode and said at least one passive electrode for intercepting ions originating from back corona discharge from said at least one passive electrode; means for applying a voltage of given polarity relative to said at least one passive electrode to said at least one corona electrode; means for applying a voltage of said given polarity relative to said at least one passive electrode to said at least one intermediate electrode at a lesser magnitude than the magnitude applied to said at least one corona discharge electrode; means for passing gas containing entrained particulate material longitudinally through the space between said at least one corona discharge electrode and said at least one intermediate electrode to charge the particles as a result of corona discharge from said at least one corona electrode; means for preventing longitudinal entry of gas containing entrained particulate material into the space between said at least one passive electrode and said at least one intermediate electrode; and wherein said separate electrostatic collection stage is positioned downstream from said charging stage.

4,233,038

REACTIVATION SYSTEM FOR WATER-CARBON DIOXIDE ADSORBERS

John C. Tao, Allentown, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Aug. 6, 1979, Ser. No. 64,233
Int. Cl.[3] B01D *53/04, 53/26*
U.S. Cl. 55—33 7 Claims



1. A method for the regeneration of molecular sieve adsorbents used in the adsorption of water and carbon dioxide contaminants from a feed gas stream passed sequentially through first and second adsorbent zones containing molecular sieve wherein the water is adsorbed in the first adsorbent zone and the carbon dioxide is adsorbed in the second adsorbent zone, which comprises:

(a) regenerating the first adsorbent zone by introducing a heated regeneration gas stream intermediate the first and second adsorbent zones, and passing the heated regeneration gas through the first adsorbent zone in a direction countercurrent to the flow of the feed gas stream therethrough; and subsequently

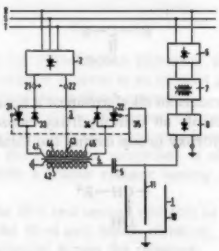
(b) cooling the first adsorbent zone and regenerating the second adsorbent zone by passing cooled regeneration gas sequentially through the first and second adsorbent zones in a direction cocurrent to the flow of the feed gas stream therethrough.

4,233,039

POWER SUPPLY FOR AN ELECTRIC PRECIPITATOR

Walter Schmidt, Uttenreuth, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Mar. 16, 1978, Ser. No. 887,135
Claims priority, application Fed. Rep. of Germany, Mar. 28, 1977, 2713675
Int. Cl.[3] B03C *3/02*
U.S. Cl. 55—139 2 Claims



1. In a power supply for an electric precipitator, said power

supply including a d-c voltage source and a pulsed a-c voltage source coupled to the high-voltage electrodes of said precipitator, the improvement comprising said pulsed a-c voltage source comprising

a high-voltage transformer including a primary winding and a secondary winding, said secondary winding being coupled to said high-voltage electrodes;

a d-c voltage source having positive and negative voltage terminals, one of which is coupled by means of a center tap to said primary winding of said transformer;

first and second thyristors, coupled to the ends of said primary winding and to the other of said voltage terminals, and adapted to be triggered in alternating fashion at the frequency of the voltage pulses desired to be generated; and

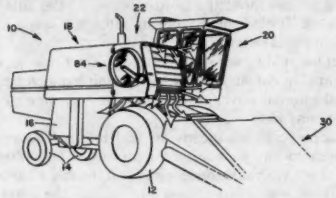
first and second diodes coupled to the ends of said primary winding and to the other of said voltage terminals in anti-parallel relationship with said first and second thyristors.

4,233,040

SELF-CLEANING ROTARY FILTER FOR THE COOLING AIR INLET OF AN ENGINE ENCLOSURE

Bernard F. Vogelaar, Moline; Bruce L. Warman, Silvis, and James R. Nelson, Geneseo, all of Ill., assignors to Deere & Company, Moline, Ill.

Filed Jul. 5, 1978, Ser. No. 922,398
Int. Cl.[2] B01D *33/22, 35/02, 35/18*
U.S. Cl. 55—269 **33 Claims**



1. In an agricultural machine having a mobile body and a power unit carried by the body, the power unit including a wall having an air inlet, an internal combustion engine, a heat exchanger for cooling the engine and a blower operable to draw cooling air through the inlet and over the heat exchanger, an improved air cleaning apparatus for the cooling air comprising:

a rotatable air filter supported adjacent the wall and having an axis of rotation and including a filter element, having a foraminous portion and exterior and interior sides, covering the inlet for filtering and holding on its exterior side foreign material from the cooling air moving through the inlet;

means for rotating the filter in a given direction;

a duct having, in relation to the direction of filter rotation, opposite leading and trailing walls and an exterior wall extending between said leading and trailing walls and having an air inlet opening adjacent the exterior side of the filter element, said duct inlet opening spanning a portion of the filter element and disposed so that as the filter rotates, other portions of the filter element move past and adjacent the opening, each portion passing in sequence adjacent the leading and trailing walls respectively, said duct being connected to the blower so that the blower draws cleaning air through the duct and through the duct inlet opening, a portion of said cooling air being diverted from the interior side of the filter element and drawn outwards through the filter element and entraining foreign material held on the exterior side of the filter element and carrying it through the duct; and

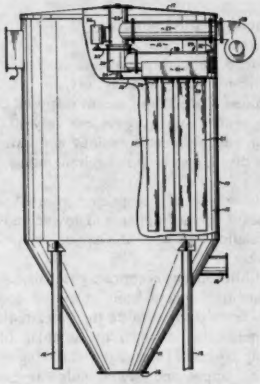
agitating means operatively associated with and responsive to air filter rotation for entering the duct intermittently and engaging at least a portion of the foreign material in the duct so as to facilitate its passage through the duct.

4,233,041

BAGHOUSE WITH ROTATING SWEEP ARM

Richard D. Noland, 1900 W. 47th Pl., Suite 308, Shawnee Mission, Kans. 66205

Filed May 14, 1979, Ser. No. 38,513
Int. Cl.[3] B01D *46/04*
U.S. Cl. 55—287 **7 Claims**



1. Apparatus for separating particulate matter from a gas stream, said apparatus comprising:

a cylindrical housing;

a substantially horizontal, circular partition disposed interiorly of said housing, thereby defining a first chamber above said partition and a second chamber beneath said partition, said partition having a plurality of uniform, circular openings therethrough, said circular openings being arranged in concentric rings outwardly from the center of said partition;

an inlet conduit connected to said second chamber for directing a particulate laden gas stream into said second chamber;

an outlet conduit communicating with said first chamber to exhaust gas therefrom;

a plurality of vertically arranged cylindrical filters disposed in said second chamber and having open upper ends secured to said openings through said partition;

a cleaning sweep arm pivotally mounted within said first chamber to rotate in a circular orbit over said partition;

drive means coupled to said cleaning sweep arm to rotate said arm in a circular orbit over said partition;

pressurized air supply means connected to said cleaning sweep arm to supply pressurized cleaning air thereto; and

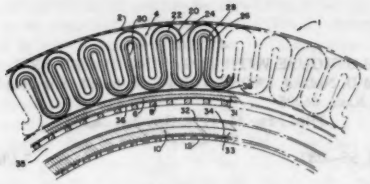
cam controlled valve means positioned and arranged with respect to said cleaning sweep arm to cause cleaning air to be delivered to one of said concentric rings of circular openings in said partition during a full revolution of said arm over said partition to thereby clean, one at a time, the filters in said one of said concentric rings, and then to cause cleaning air to be delivered through the circular openings, one at a time, of another of said concentric rings during the subsequent revolution of said arm.

4,233,042

AIR-OIL SEPARATOR

Ting C. Tao, Bedford Heights, Ohio, assignor to Incom International Inc., Pittsburgh, Pa.

Filed Mar. 6, 1978, Ser. No. 884,051
Int. Cl.³ B01D *50/00*
U.S. Cl. 55—482 **10 Claims**



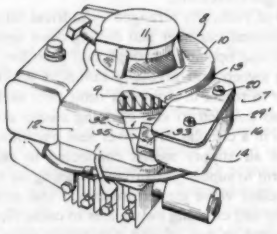
1. Separator apparatus comprising;
upper and lower supports
radially spaced annular permeable casings concentrically disposed about a central axial core,
first and second spaced filter means disposed concentrically about the central axial core respectively on opposite sides of one of said permeable casings and extending axially between the supports for agglomerating and filtering fluids,
said first filter means comprising pleated agglomerator media means having upper and lower ends disposed in sealing relationship with the upper and lower supports respectively,
said second filter means comprising radially spaced annular filter elements concentrically disposed about the core, wrapped directly adjacent on the outer radial side of one of said permeable casings, the annular filter elements comprising layers of filter material having relatively high loft having upper and lower ends disposed in sealing relationship with the upper and lower supports respectively,
said casings, said annular filter elements and said agglomerator media means having upper and lower ends disposed in sealing relationship with the upper and lower supports respectively.

4,233,043

AIR CLEANER FOR INTERNAL COMBUSTION ENGINE

Robert K. Catterson, Brookfield, Wis., assignor to Briggs & Stratton Corporation, Wauwatosa, Wis.

Filed Aug. 30, 1978, Ser. No. 938,039
Int. Cl.³ B01D *50/00*
U.S. Cl. 55—315 **1 Claim**



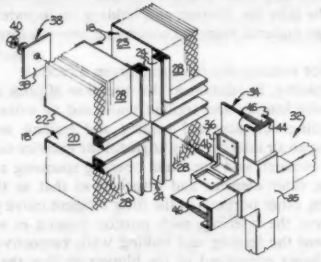
1. In combination with (a) an internal combustion engine having a blower housing through which cooling air is circulated by a blower, (b) a carburetor and an air intake leading thereto, and (c) an air filter element enclosed in a filter housing to filter air flowing between an air intake to the housing and an air outlet from the housing that is connectible to the air intake leading to the carburetor,
the improvement comprising:
(1) a straight air duct having opposed open ends, one of the open ends comprising an entrance to the duct and the other an exit from the duct,
the entrance of the air duct being positioned within the blower housing to receive air circulated by the blower and direct the air with an abrupt change in direction to flow towards the exit of the duct,
(2) the air intake to the filter housing communicating at an angle with the air duct so that air entering the filter housing undergoes a second abrupt change of direction and much of any particulate contaminants entrained in the air flowing through the duct leave through the exit end of the duct,
(3) the filter housing having bottom and side walls and a removable cover,
(4) the air filter element being in the form of an endless air pervious wall having inner and outer surfaces and having top and bottom edges, the latter of which is seated on the bottom wall of the filter housing and the filter element dividing the filter housing into inner and outer compartments,
(5) the air intake to the filter housing leading to said inner compartment,
(6) guide means on the inner surface of the bottom wall of the filter housing snugly fitting the bottom edge of the filter element to minimize the possibility of leakage of air from the inner compartment to the outer compartment and to also hold the bottom edge of the filter element against displacement from its intended shape by suction within said outer compartment,
(7) an internal cover snugly fitted to the top edge of the air filter element, and a removable retaining member drawing said internal cover down onto the top edge of the filter element, and
(8) shape retaining means on said internal cover engaged over opposite portions of the top edge of the filter element to coact with said guide means on the inner surface of the bottom wall of the shell in holding the filter element against displacement from its intended shape.

4,233,044

SELF-CLEANING FLUID SEALED AIR FILTER

Thomas T. Allan, San Francisco, Calif., assignor to Flanders Filters, Inc., Washington, N.C.

Filed May 13, 1976, Ser. No. 685,977
Int. Cl.³ B01D *46/54*
U.S. Cl. 55—355 **1 Claim**



1. A high efficiency air filter comprising a frame formed of wooden or chipboard material and having a centrally disposed air flow opening therethrough and a front peripheral surface surrounding said airflow opening, a continuous channel formed in said front peripheral surface in the material of said frame and extending rearwardly from said front surface of said frame a substantial distance, a filter pack sealably disposed

within said frame and filling said air flow opening, a fluid substantially filling said channel to a level not above said front surface and having a consistency substantially the same as that of petrolatum and characterized as being subject to easy deformation at room temperature, and such that the fluid filled sealing channel is adapted to sealably receive a mating retaining flange in the housing to seal the filter in assembled relation therein, the improvement therein comprising

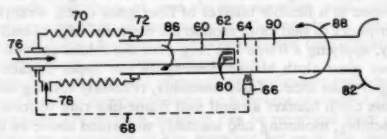
means mounted to said frame for contacting each side of the mating retaining flange and for wiping the sides of the retaining flange substantially free of the fluid upon the filter being withdrawn from the retaining flange and housing, said contacting and wiping means comprising a pair of resilient wiper lips adhered to said front surface of said frame and extending across the top of said channel from opposite sides thereof to substantially cover and enclose said fluid, and a frangible portion interconnecting said wiper lips.

4,233,045

APPARATUS AND METHOD FOR MAKING OPTICAL FILAMENT PREFORM

Arnab Sarkar, Big Flats, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Nov. 27, 1978, Ser. No. 963,837
Int. Cl.³ C03C *7/02*
U.S. Cl. 65—3 A **17 Claims**



1. In the method of manufacturing an optical waveguide preform which includes the steps of:

providing a first tube,

moving a heat source relative to said first tube in a longitudinal direction, thereby forming within said first tube a moving hot zone, and

flowing a reactant gas through said hot zone to produce a suspension of particulate material, at least a portion of which flows downstream from said hot zone where at least a portion thereof comes to rest on the inner surface of said first tube in a region of said first tube that is cooler than that portion of said tube that surrounds said hot zone, to form a deposit on said inner surface,

the improvement which comprises:

moving a second tube within said first tube while maintaining the end of said second tube, which is within said first tube, a fixed distance from said hot zone; and

flowing at least a portion of said reactant gas through said second tube, radially outwardly from the end thereof, and through said hot zone.

4,233,046

METHOD OF MAKING GLASS FIBERS HAVING A REDUCED TENDENCY TO GIVE GUMMING DEPOSITS

Douglas M. Walser, Lexington, N.C., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 946,996, Sep. 29, 1978. This application Jun. 22, 1979, Ser. No. 51,087
Int. Cl.³ C03C *25/02*
U.S. Cl. 65—3 C **7 Claims**

1. In a method of forming a sized glass fiber strand comprising drawing glass streams through orifices in a bushing to form individual glass fibers, moving the fibers away from the bushing at a high rate of speed and forming them into a strand, and applying to the fibers while they are moving at this speed and before they are formed into a strand a starch-based sizing solution; 4 percent to 52 percent by weight of the salt of a polyamino functional polyamide resin, said polyamino functional polyamide resin salt being formed from the condensation reaction product of a carboxylic acid and a polyamine, said polyamine having greater than 2 amine groups per molecule, and a carboxylic acid having 1 to 5 carbon atoms; 5 to 25 percent by weight of a wax from the group consisting of animal waxes, vegetable waxes, mineral waxes and synthetic waxes; and 9 percent to 77 percent by weight of a fatty triglyceride; and collecting the glass strands so produced; the improvement comprising:

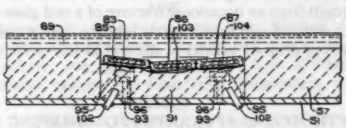
using in the size solution about 50 to about 65 weight percent based on the non-aqueous components in the solution of a starch containing cross-links that has been partially cooked to within about 50 percent of complete cooking so that the sized glass strands produced have a reduced tendency to form gummy deposits under high relative humidity conditions.

4,233,047

IN SITU REPAIR OF DELAMINATED FLOAT BATH BOTTOM REFRACTORY

James C. Stultz, and George A. Pecoraro, both of Lower Burrell, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed May 1, 1979, Ser. No. 35,038
Int. Cl.³ C03B *18/16*
U.S. Cl. 65—27 **10 Claims**



1. A method of repairing a cavity in the bottom of a glass float forming chamber containing molten metal comprising: limiting the glass flow in the chamber to eliminate glass overlying said cavity, opening an access into the chamber above the level of the molten metal, inserting through said access and into the molten metal a repair block which comprises a material selected from the group consisting of tungsten, molybdenum, tantalum, and alloys and ceramic refractory combinations thereof such that the aggregate repair block has a higher specific gravity than the molten metal in the chamber, the repair block being of a size adapted to fit within the cavity without substantially projecting above the elevation of the chamber bottom, and moving the repair block into the cavity, whereby further growth of the cavity is inhibited.

4,233,048

REMOVING FRAGMENTS OF FRACTURED GLASS SHEETS DURING TEMPERING

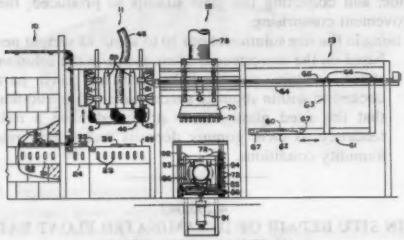
Dean W. Gintert, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jul. 5, 1979, Ser. No. 55,203
Int. Cl.³ C03B *27/04*
U.S. Cl. 65—27 **9 Claims**

1. In a method of tempering glass sheets wherein a hot glass sheet is supported between upper and lower nozzle housings which apply cold tempering medium toward the opposite major surfaces of said glass sheet at a rate sufficient to establish at least a partial temper in the glass sheet, whereby sometimes said sheet is fractured to form fragments during said cooling step and said lower nozzle housing is pivoted to remove at least some of said fragments by sliding, the improvement comprising pivoting said lower nozzle housing beyond an orientation that requires said fragments to be removed by sliding to an orientation wherein fragments that do not slide off the lower nozzle housing during said pivoting to said orientation are free to drop by gravity without sliding from said lower nozzle

housing when said lower nozzle housing pivots beyond said orientation.

5. Apparatus for tempering glass sheets comprising an upper nozzle housing having a lower apertured wall and a lower nozzle housing having an upper apertured wall, means for supporting said housings in operative positions relatively closely spaced to one another to define a narrow passage therebetween for receiving a glass sheet between said nozzle



housings, means to supply cold tempering medium under pressure to said upper and lower nozzle housings for delivery through the apertures of said apertured walls toward the opposite major surfaces of said glass sheet, means for pivoting said lower nozzle housing into an orientation such that fragments that result from an occasional fracture of a said glass sheet that do not slide off said lower nozzle housing during said pivoting are free to drop by gravity at the end of said pivoting.

4,233,049

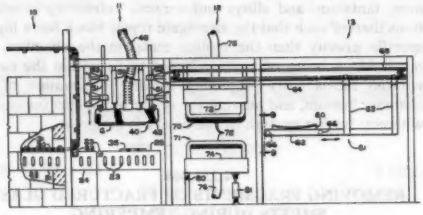
METHOD AND APPARATUS FOR SHAPING GLASS SHEETS BY DROP FORMING

Samuel L. Seymour, Oakmont, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 960,404, Nov. 13, 1978, abandoned. This application Jun. 1, 1979, Ser. No. 44,425

Int. Cl.³ C03B *23/02*

U.S. Cl. 65—106 **25 Claims**



1. A method of shaping glass sheets, comprising the steps of:

heating a glass sheet to approximately its softening point and bringing the glass sheet to rest on support means;

translating a vacuum platen having a flat, perforated surface toward the support means to bring the flat, perforated surface into close proximity to, and parallel with, a surface of the glass sheet;

drawing vacuum through the flat, perforated surface so as to retain the glass sheet on the platen;

translating the platen away from the support means to lift the glass sheet from the support means and to bring the glass sheet into a generally horizontal orientation on the underside of the platen;

bringing into vertical alignment with and beneath the glass sheet held on the platen a shaping mold having a contour defining the desired contour for the glass sheet; and

releasing the glass sheet from the platen so as to fall onto the shaping mold and conform to the contour defined by the shaping mold.

4,233,050

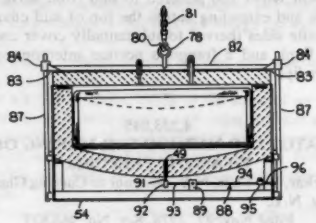
SHAPING GLASS SHEETS BY GRAVITY SAG BENDING FOLLOWED BY BLOW FORMING

John A. Comperatore, Natrona Heights; David J. Wise, New Kensington, and Edward D. Black, Brackenridge, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 9, 1979, Ser. No. 18,964

Int. Cl.² C03B *23/02*

U.S. Cl. 65—107 **9 Claims**



6. A method of shaping glass sheets by blow forming comprising cradling an assembly of at least two glass sheets to be shaped in a flexible blanket of fiber glass cloth, wrapping the periphery of said cloth around the marginal edge of said assembly, applying a frame-like ring over the folded portion of said fiber glass cloth blanket resting on the upper surface of the upper glass sheet of said assembly, reversely folding said fiber glass cloth blanket around said frame-like ring to form a ring assembly, mounting said assembly so formed above an upward facing shaping surface of a blow forming tool, heating said ring assembly so formed and so mounted to the glass deformation temperature, but below the devitrification temperature of the glass while mounted over said shaping surface, enclosing said blow forming tool to form a sealed chamber containing said ring assembly, and pressurizing said sealed chamber at a low positive pressure while maintaining said deformation temperature until said glass sheets conform to said shaping surface of said blow forming tool.

4,233,051

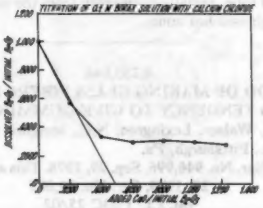
METHOD FOR PRODUCING CALCIUM BORATES

Walter L. Eastes, Granville, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Jun. 11, 1979, Ser. No. 47,521

Int. Cl.³ C03C *13/00, 3/14*

U.S. Cl. 65—134 **11 Claims**



1. A method for producing calcium borates by precipitation from solution comprising an initial step of forming an aqueous solution of borax and calcium chloride wherein the calcium chloride calculated as CaO and the borax calculated as B_2O_3 are presented in initial amounts having a molar ratio of CaO/B_2O_3 ranging from 0.2 to 0.6.

4,233,052

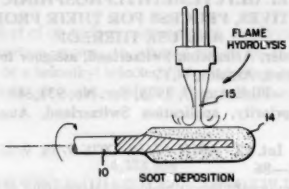
CARBON COATING FOR A STARTING MEMBER USED IN PRODUCING OPTICAL WAVEGUIDES

Ellen K. Dominick, Trumansbury, and George W. Scherer, Painted Post, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Division of Ser. No. 828,149, Aug. 26, 1977. This application Apr. 16, 1979, Ser. No. 30,353

Int. Cl.³ C23C *13/08*

U.S. Cl. 65—144 4 Claims



1. Apparatus for making preforms for optical waveguides comprising:

a substantially cylindrical starting member having a smooth outside peripheral surface;

a coating of particulate carbon without impurities on the outside periphery of said starting member, said carbon being present in an amount which is completely disintegrated during heating to the consolidation temperature of glassmaking particulate material; and

means for applying said glassmaking particulate material to said starting member to form an adherent coating of glass; whereby the starting member can be removed from said glass by separation at the interface between the carbon and the starting member or shearing within the carbon layer, to produce a preform from the glass.

4,233,053

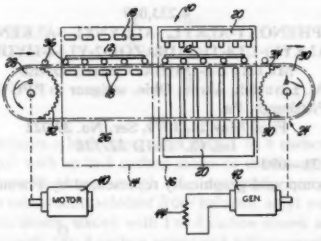
SPEED ADAPTIVE CONVEYOR DRIVE FOR A GLASS MANUFACTURING SYSTEM

John S. Nitschke, 324 E. Second, Perrysburg, Ohio 43551

Filed Mar. 16, 1979, Ser. No. 21,136

Int. Cl.³ C03B *35/18*

U.S. Cl. 65—163 8 Claims



1. A conveyor drive system for transporting a glass sheet through a glass processing station along a direction of travel comprising:

a conveyor drive defined by at least one continuous drive loop trained over first and second pulleys mounted at opposed ends of a lateral side of the processing station;

a plurality of elongated rollers spaced apart from one another along the direction of travel and extending transversely with respect thereto, the plurality of rollers being in driving engagement with the conveyor drive for rotational motion upon motion of the continuous drive loop;

drive torque means, coupled to the first pulley of the conveyor drive, for providing driving torque to the conveyor drive to move the glass sheet along the direction of travel; and

means, driven by the second pulley of the conveyor drive, for providing a counter-torque which increases with the speed of the second pulley for the purpose of stabilizing the motion of the conveyor drive.

8. In a glass sheet conveyor system for a glass processing station of the type having a conveyor drive defined by at least one continuous drive loop trained over first and second spaced pulleys mounted at opposed ends of a lateral side of the processing station; a glass sheet transport bed defined by a plurality of elongated rollers, the plurality of rollers being in driving engagement with the continuous drive loop; and torque means for applying torque to the first pulley of the conveyor drive; the improvement comprising:

means driven by the second pulley for applying an adaptive counter-torque to the second pulley of the conveyor drive in response to the speed of the second pulley, which, in cooperation with the torque means stabilizes the motion of the conveyor drive against slip-stick frictional phenomenon.

4,233,054

PHENOXY-ALKANECARBOXYLIC ACID DERIVATIVES, THEIR PRODUCTION, HERBICIDAL COMPOSITIONS CONTAINING THEM, AND THEIR USE

Henry Szczepanski, Rheinfelden; Otto Rohr, Therwil, both of Switzerland; Georg Pissiotas, Lörrach, Fed. Rep. of Germany; Beat Böhner, and Hermann Rempfler, both of Binningen, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

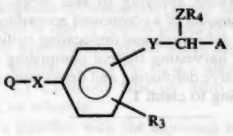
Filed Mar. 12, 1979, Ser. No. 19,999

Claims priority, application Switzerland, Mar. 17, 1978, 2932/78

Int. Cl.³ A01N *29/08*; C07C *69/76, 101/72*

U.S. Cl. 71—70 10 Claims

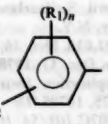
1. A phenoxy-phenoxy-alkanecarboxylic acid derivative of the formula I



(I)

in which

Q is a radical



A is a radical —COB,

B is a radical —OR_5,

R_1 is a halogen atom,

n is the number 0, 1 or 2,

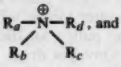
R_2 is a halogen atom or the trifluoromethyl, nitro, or carbamoyl group,

R_3 is hydrogen, halogen, a C_1–C_4-alkyl group, or the nitro, or carbamoyl group,

R_4 is C_1–C_6-alkyl, C_2–C_6-alkenyl, C_2–C_6-alkynyl, benzyl or phenyl both optionally substituted by halogen, or C_2–C_6-alkoxyalkyl or C_3–C_{12} cycloalkyl,

R_5 is hydrogen or the cation of a base $1/mM^{m\oplus}$ wherein M is an alkali metal cation or an alkaline—earth metal cation

or an Fe, Cu, Zn, Mn or Ni cation, or an ammonium group



m as integer 1, 2 or 3 takes account of the valency of the cation, and R_a, R_b, R_c and R_d independently of one another are each hydrogen, benzl or a C_1–C_4-alkyl group which is unsubstituted or substituted by —OH, —NH_2 or C_1–C_4-alkoxy, or

R_5 is a C_1–C_{18}-alkyl group which is unsubstituted or is substituted by halogen, nitro, C_1–C_8-alkoxy, C_2–C_8-alkoxyalkoxy, C_3–C_6-alkenyloxy, C_1–C_8-alkylthio, C_2–C_8-alkanoyl, C_2–C_8-acyloxy, C_2–C_8-alkoxycarbonyl, carbamoyl, bis-(C_1–C_4-alkyl)amino, tris-(C_1–C_4-alkyl)-ammonium, C_3–C_8-cycloalkyl, C_3–C_8-cycloalkenyl, or a phenoxy group which is unsubstituted or in its turn mono- or poly-substituted by halogen, C_1–C_4-alkyl or C_1–C_4-alkoxy; or is a C_3–C_{18}-alkenyl group which is unsubstituted or is mono- to tetrasubstituted by halogen or monosubstituted by phenyl or methoxy-carbonyl; or is a C_3–C_8-alkynyl group; or a C_3–C_{12}-cycloalkyl group which is unsubstituted or substituted by halogen or C_1–C_4-alkyl; or a C_3–C_8-cycloalkenyl group; or a phenyl group which is unsubstituted or is mono- or poly-substituted by halogen, C_1–C_4-alkyl, C_1–C_4-alkoxy, C_1–C_4-alkylthio, NO_2, CF_3, COOH, OH, SO_3H, NH_2 or —NH(C_1–C_4-alkyl) or —N(C_1–C_4-alkyl)$_2$;

X, Y and Z are each an oxygen atom or a sulfur atom.

5. A herbicidal and plant-growth regulating composition which contains as active substance an effective amount of a phenoxy-phenoxy-alkanecarboxylic acid derivative of the formula I, claim 1, together with a suitable carrier therefor.

6. A method for the selective control of weeds in crops of cereals or rice comprising applying thereto or the locus thereof a herbicidally effective amount of a compound according to claim 1.

8. A method for reducing the vegetative growth in soya bean crops comprising applying to said crops an effective growth reducing amount of a compound according to claim 1.

9. A method for defoliating and desiccating cultivated plants shortly before the harvesting thereof comprising applying to said plants an effective defoliating and desiccating amount of a compound according to claim 1.

4,233,055
QUATERNARY AMMONIOALKANECARBOXYLIC ACID ANILIDES AS PLANT GROWTH INFLUENCING AGENTS

Henry Martin, Allschwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

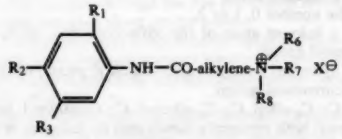
Division of Ser. No. 751,616, Dec. 16, 1976, Pat. No. 4,141,718. This application Dec. 11, 1978, Ser. No. 968,317

Claims priority, application Switzerland, Dec. 23, 1975, 16704/75; Dec. 23, 1975, 16705/75

Int. Cl.[3] C07C *103/54, 103/68, 103/70*

U.S. Cl. 71—76 7 Claims

1. A compound of the formula



wherein

R_1 is hydrogen, chlorine, methyl or trifluoromethyl,

R_2 is methyl, halogen or n-butoxy,

R_3 is hydrogen, chlorine or trifluoromethyl,

"alkylene" has from 1 to 3 carbon atoms,

one of R_6, R_7 and R_8 is C_1-C_4 alkyl, cyclopropylmethyl, cyanomethyl, allyl, butenyl, or propargyl and the other two of R_6, R_7 and R_8 are allyl, and

X is the anion of any non-phytotoxic acid.

4,233,056
NOVEL GLYCYLMETHYLPHOSPHINIC ACID DERIVATIVES, PROCESS FOR THEIR PRODUCTION AND USE THEREOF

Ludwig Maier, Arlesheim, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

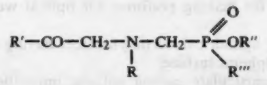
Filed Aug. 7, 1978, Ser. No. 931,343

Claims priority, application Switzerland, Aug. 11, 1977, 9883/77

Int. Cl.[3] A01N *57/10;* C07F *9/30, 9/32*

U.S. Cl. 71—86 6 Claims

1. A glycylmethylphosphinic acid derivative of the formula I



(I)

wherein

R represents hydrogen, a C_1–C_6 alkyl radical, benzyl, diphenylmethyl or triphenylmethyl, or the group HOO-C—CH_2—,

R′ represents a —OH or —OR_1 group, in which R_1 represents a cation, a C_1–C_6 alkyl radical, a C_1–C_6 alkyl radical substituted by halogen, hydroxyl, lower alkoxy, carboxyl or cyano, a lower alkenyl or alkynyl radical, a cycloalkyl radical, or R′ represents the amino group,

R″ represents hydrogen, a cation, and lower alkyl or hydroxyalkyl,

R‴ represents a C_1–C_4 alkyl radical which can be mono- or polysubstituted by halogen atoms, hydroxyl or carboxyl groups, or represents a phenyl radical, or a phenyl radical substituted by halogen, lower alkyl, haloalkyl or di-(lower) alkylamino, and the plant physiologically acceptable salts thereof.

4,233,057
3-[5-(1-PHENOXY-ALKYL, -ALKYNYL, -ALKENYL, OR HALOALKYL)-1,3,4-THIADIAZOL-2-YL]-4-HYDROXY-1-METHYL-2-IMIDAZOLIDINONES

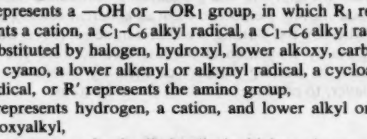
Jerome M. Lavanish, Akron, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed May 14, 1979, Ser. No. 39,021

Int. Cl.[3] C07D *277/38*

U.S. Cl. 71—090 25 Claims

1. A compound graphically represented by Formula I



wherein:

R is an alkyl of up to four carbon atoms,

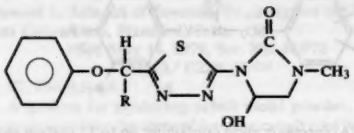
an alkenyl of up to three carbon atoms,

an alkynyl of up to three carbon atoms, or

a haloalkyl selected from the group consisting of chloromethyl, bromomethyl, 2-chloroethyl, and 2-bromoethyl.

10. A method of controlling weeds, which comprises con-

tacting the weeds with a herbicidally effective amount of a compound graphically represented by Formula I



(I)

wherein

R is an alkyl of up to four carbon atoms, an alkynyl of up to three carbon atoms, an alkenyl of up to three carbon atoms, or a haloalkyl selected from the group consisting of chloromethyl, bromomethyl, 2-chloroethyl and 2-bromoethyl.

4,233,058

4,5-DICHLORO-IMIDAZOLE-1-CARBOXYLIC ACID ARYL ESTERS AND THEIR USE AS PLANT PROTECTION AGENTS

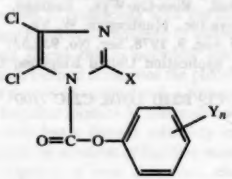
Klaus Sasse, Berg. Gladbach; Gunther Beck; Ludwig Eue, both of Leverkusen, and Robert R. Schmidt, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 835,092, Sep. 21, 1977, Pat. No. 4,183,742. This application Mar. 23, 1979, Ser. No. 23,362

Int. Cl.³ A01N *43/50;* **C07D** *233/90*

U.S. Cl. 71—92 **5 Claims**

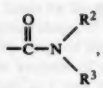
1. A 4,5-dichloro-imidazole-1-carboxylic acid aryl ester of the formula



(I)

in which

X represents



in which

R^2 represents a hydrogen, alkyl with 1 to 8 carbon atoms, alkenyl with up to 8 carbon atoms or the formyl group,

R^3 represents phenyl which may optionally carry one or more substituents selected from halogen, alkyl with 1 to 4 carbon atoms, alkoxy with 1 to 4 carbon atoms, alkylmercapto with 1 to 4 carbon atoms and trifluoromethyl,

Y represents halogen, alkyl with 1 to 6 carbon atoms, trifluoromethyl, alkoxy with 1 to 6 carbon atoms, alkylmercapto with 1 to 6 carbon atoms, nitro, cyano or a

group

in which

R^4 represents alkyl with 1 to 6 carbon atoms and n represents 0, 1, 2, 3, 4 or 5.

5. A method of protecting a plant against weeds which comprises applying to the plant or its habitat a herbicidally effective amount of a compound according to claim 1.

4,233,059

1,2,3-TRIAZOLE CARBOXYLIC ACID AMIDES AND BIOCIDAL COMPOSITIONS CONTAINING THE SAME

Hans-Rudolf Krüger; Friedrich Arndt; Dietrich Baumert; Hartmut Joppien; Ernst A. Pieroh, and Reinhart Rusch, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

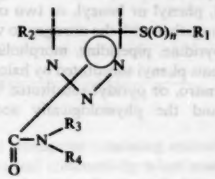
Filed Aug. 1, 1979, Ser. No. 62,795

Claims priority, application Fed. Rep. of Germany, Aug. 7, 1978, 2834879

Int. Cl.³ C07D *249/04;* **A01N** *9/12, 9/14*

U.S. Cl. 71—92 **152 Claims**

1. 1,2,3-triazole carboxylic acid amides of the formula



I,

in which

R_1 is C_1–C_{10}-alkyl, C_2–C_8-alkenyl or alkinyl or is aryl-C_1–C_3-alkyl which may be substituted in one or several places by C_1–C_6-alkyl and/or halogen and/or C_1–C_6-alkoxy and/or nitro and/or trifluoromethyl,

R_2 is hydrogen or C_1–C_{10} alkyl in which the chain may be interrupted in one or several places by oxygen- or sulfur atoms and which may be substituted by halogen,

R_3 and R_4 are the same or different and are hydrogen, C_1–C_{10} alkyl, C_1–C_{10} alkyl which is substituted by halogen or C_1–C_3-alkoxy, C_2–C_8-alkenyl or alkinyl, aryl-C_1–C_3-alkyl which may be substituted in one or several places by C_1–C_6-alkyl and/or halogen and/or C_1–C_6-alkoxy and/or nitro and/or trifluoromethyl, a C_3–C_8 cyclo aliphatic hydrocarbon group which may also be substituted in one or several places by C_1–C_6-alkyl, or an aromatic hydrocarbon group which may be substituted in one or several places by C_1–C_6 alkyl and/or halogen and/or C_1–C_6-alkoxy and/or nitro and/or trifluoromethyl, or wherein

R_3 and R_4 together with the adjoining nitrogen atom conconstitute a 3 to 7-member ring which may include further oxygen, sulfur or nitrogen atoms and wherein

n is 0, 1 or 2,

or an isomeric mixture from any of the listed compounds.

152. A biocidal composition having herbicidal, insecticidal, acaricidal, fungicidal and/or nematocidal activity comprising about 10 to 80% by weight of the active agents of claim 1 and about 90 to 20% by weight of liquid or solid carrier materials which may include up to about 20% by weight of surface active agents.

4,233,060

α-PHENOXY-THIOLPROPIONIC ACIDS

Beat Böner, Binningen; Otto Rohr, Therwil; Hermann Rempfler, Binningen, all of Switzerland, and Georg Pissiotas, Lörach, Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsely, N.Y.

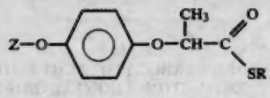
Filed Nov. 20, 1978, Ser. No. 962,517

Claims priority, application Switzerland, Nov. 24, 1977, 14398/77

Int. Cl.³ C07C *153/23;* **C07D** *213/62, 295/08, 295/14*

U.S. Cl. 71—94 **8 Claims**

1. A compound of the formula



wherein R represents hydrogen, a metal cation or an amine or ammonio cation

wherein each of R_2, R_3, R_4, R_5 independently represents hydrogen, C_1–C_4 alkyl, C_1–C_4 alkyl substituted by hydrogen or cyano, cyclohexyl, phenyl or benzyl, or two or three of the symbols R_2 to R_5, together with the nitrogen to which they are attached form a pyridine, piperidine, morpholine or picoline ring; and Z represents phenyl substituted by halogen, trifluoromethyl, cyano or nitro, or pyridyl substituted by halogen or trifluoromethyl, and the physiologically acceptable salts thereof.

4,233,061

NOVEL BENZENESULFONAMIDE DERIVATIVES

Tetsuo Takematsu; Makoto Konnai, and Hiroyoshi Omokawa, all of Utsunomiya, Japan, assignors to Utsunomiya University, Tochigi, Japan

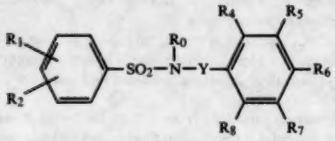
Division of Ser. No. 837,911, Sep. 29, 1977, Pat. No. 4,157,257. This application Dec. 29, 1978, Ser. No. 974,517

Claims priority, application Japan, Oct. 1, 1976, 51/118343; May 20, 1977, 52/58369; Aug. 2, 1977, 52/92803

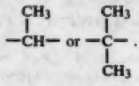
Int. Cl.[2] A01N *9/14*

U.S. Cl. 71—103 **24 Claims**

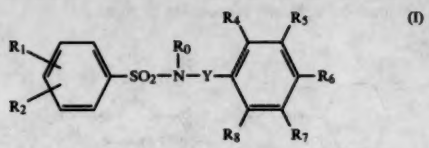
1. A compound of the formula



wherein R_0 represents alkyl containing up to 15 carbon atoms, alkenyl containing 2 to 4 carbon atoms or propargyl; R_1 and R_2, independently from each other, represent hydrogen, halogen, alkyl containing 1 to 4 carbon atoms or alkoxy containing 1 to 4 carbon atoms; one or two of R_4, R_5, R_6, R_7 and R_8 represent hydrogen, halogen, alkyl containing 1 to 4 carbon atoms or alkoxy containing 1 to 4 carbon atoms and the remainder represent hydrogen; and Y represents

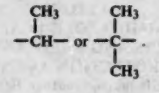


19. A method for controlling weeds in a rice crop which comprises applying to the locus to be protected from the weeds a herbicidally effective amount of a compound of the formula



(I)

wherein R_0 represents alkyl containing up to 15 carbon atoms, alkenyl containing 2 to 4 carbon atoms or propargyl; R_1 and R_2, independently from each other, represent hydrogen, halogen, alkyl containing 1 to 4 carbon atoms or alkoxy containing 1 to 4 carbon atoms; one or two of R_4, R_5, R_6, R_7 and R_8 represent hydrogen, halogen, alkyl containing 1 to 4 carbon atoms or alkoxy containing 1 to 4 carbon atoms and the remainder represent hydrogen; and Y represents



4,233,062

ATOMIZATION INTO A CHAMBER HELD AT REDUCED PRESSURE

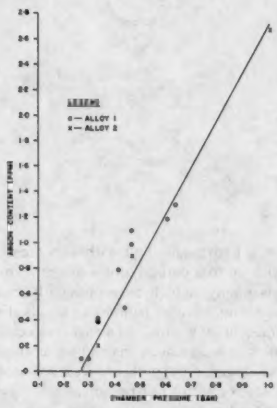
Richard J. Siddall, Ross-On-Wye, England, assignor to Huntington Alloys Inc., Huntington, W. Va.

Filed Aug. 9, 1978, Ser. No. 932,327

Claims priority, application United Kingdom, Oct. 8, 1977, 33555/77

Int. Cl.[3] B22D *23/08*; C21C *7/00*

U.S. Cl. 75—0.5 C **7 Claims**



1. In a process for the production of metal powder by atomization of a molten metal stream in which a gaseous medium is impinged there against, the improvement which comprises reducing the gas entrapment of the metal powder produced by conducting the atomization process at a subatmospheric pressure of about 0.5 bar (0.05 M Pa) or below during the atomization period in which said gaseous medium impinges against said molten metal stream and maintaining said subatmospheric pressure at said level until the process is substantially complete.

4,233,063

PROCESS FOR PRODUCING COBALT POWDER

Joseph E. Ritsko; John J. Culkin; Martin B. MacInnis, and Howard L. Acla, all of Towanda, Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed May 14, 1979, Ser. No. 38,972
Int. Cl.[2] C22B 23/04
U.S. Cl. 75—0.5 AA 9 Claims

1. A process for producing cobalt metal powder, the basic process comprising the steps of forming cobalt ions in solution, complexing said cobalt ions with ammonia in the presence of halide ions to form a cobalt ammine halide solution, digesting said cobalt ammine halide solution in the presence of ammonia to form a cobalt containing precipitate, separating said cobalt containing precipitate from the resulting solution, and heating cobalt containing precipitate in a reducing atmosphere to obtain a cobalt metal powder wherein the improvement comprises heating the resulting solution at a pH from about 7.5 to 14 at a sufficient temperature for a sufficient period of time to produce an ammonia enriched vapor and an aqueous mixture comprising a solution substantially free of ammonia and another cobalt containing precipitate.

4,233,064

METHOD OF SCAVENGING STEEL

Edward J. Dunn, Jr., 101 B Village Round, Wescosville, Pa. 18106

Continuation-in-part of Ser. No. 942,139, Sep. 13, 1978. This application Apr. 4, 1979, Ser. No. 26,902
Int. Cl.[3] C21C 7/00, 7/02, 7/04
U.S. Cl. 75—58 20 Claims

1. A method of refining steel characterized by a safer more effective and efficient adding of an active elemental or alloyed substance capable of combining with the dissolved impurities for the primary purpose of reducing or eliminating the voluminous polluting smoke that is normally associated with such additions which method comprises the placement upon the end of a refractory covered vertical rod, a consummable solid body of a pressed together mixture of materials comprising an active substance which has a limited solubility in the steel and an inactive material or mixtures of inactive material selected from the group consisting of iron, aluminum, elements which will alloy with the steel and oxides thereof, so that upon effecting an immersion of the subsequent assembly into a deep molten steel pool and the holding in place thereof, the pressed together shape dissolves, with the rate of dissolution being controlled to within desired limits by the appropriate choice of the composition and dimensional shape of the solid body, resulting in the composition and the shape of the solid body providing a means by which a given amount of active substance can be added to the molten steel at a rate that does not allow the active substance to exceed its solubility limit in the steel and thus prevent any active substance from reaching the surface to react with the air to cause air pollution.

4,233,065

EFFECTIVE BORON ALLOYING ADDITIVE FOR CONTINUOUS CASTING FINE GRAIN BORON STEELS

Maharaj K. Koul, Tonawanda, N.Y., assignor to Foote Mineral Company, Exton, Pa.

Continuation-in-part of Ser. No. 888,338, Mar. 20, 1978, abandoned. This application Dec. 8, 1978, Ser. No. 967,696
Int. Cl.[2] C21C 7/00; B22D 27/18, 21/02
U.S. Cl. 75—134 S 3 Claims

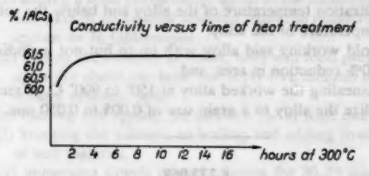
1. A boron alloying additive for continuous casting of boron steel consisting essentially of from about 0.5 to about 1.5 percent boron, from about 8 to about 15 percent calcium, from about 8.5 to about 20 percent titanium, up to about 1.5 percent of aluminum, from about 40 to about 60 percent silicon and balance iron, said percentages being by weight, based on the total weight of said alloy.

4,233,066

ELECTRICAL CONDUCTOR OF ALUMINIUM

Anders O. Sundin, Helsingborg, and Wolfgang A. Bronnvall, Hittarp, both of Sweden, assignors to Aktiebolaget Elektrokoppar, Helsingborg, Sweden

Continuation-in-part of Ser. No. 520,947, Nov. 4, 1974, abandoned, which is a continuation of Ser. No. 323,274, Jan. 12, 1973, abandoned. This application Aug. 14, 1975, Ser. No. 604,714
Claims priority, application Sweden, Apr. 27, 1972, 5549/72
Int. Cl.[3] C22C 21/16
U.S. Cl. 75—142 12 Claims



1. Electrical conductor consisting essentially of aluminium having an electrical conductivity when unannealed of at least 59% of the conductivity for annealed copper according to international standard (International Annealed Copper Standard, IACS), in which the conductor consists essentially of 0.001–0.10 percent by weight of beryllium, 0.05–0.35 percent by weight copper and 0.01–0.20 percent by weight magnesium, the total amount of beryllium, copper and magnesium being at the most 0.50 percent by weight, balance aluminium.

4,233,067

SOFT COPPER ALLOY CONDUCTORS

Kazuo Sawada, Osaka, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jan. 8, 1979, Ser. No. 1,955
Claims priority, application Japan, Jan. 19, 1978, 53-5070; Jan. 20, 1978, 53-5530
Int. Cl.[2] C22C 9/00; C22F 1/08
U.S. Cl. 75—153 2 Claims

1. Soft copper alloy conductors which consist essentially of 5–200 ppm of calcium, the balance being substantially copper, and having a 0.2% proof stress which is 12 kg/mm^2 or less.

4,233,068

MODIFIED BRASS ALLOYS WITH IMPROVED STRESS RELAXATION RESISTANCE

Warren F. Smith, Jr., Branford, Conn.; John M. Vitek, Oak Ridge, Tenn., and Eugene Shapiro, Hamden, Conn., assignors to Olin Corporation, New Haven, Conn.

abandoned. This application Nov. 5, 1979, Ser. No. 91,416
Int. Cl.[3] C22C 9/04; C22F 1/08
U.S. Cl. 75—157.5 16 Claims

1. An essentially single-phase alpha alloy which is particularly resistant to stress relaxation at elevated temperatures, said alloy consisting essentially of one component selected from the group consisting of 0.05 to 0.5% by weight magnesium or 0.05 to 0.5% by weight magnesium in combination with 0.02 to 0.5% by weight aluminum, a second component selected from the group consisting of 0.05 to 3.0% by weight silicon or 0.05 to 0.3% by weight silicon in combination with 0.1 to 2.0% by weight tin, from 8 to 32.8% by weight zinc, balance copper, with the amount of said aluminum, silicon or tin being inversely related to the amount of said zinc and with the maximum wt.% zinc=32.8 $-4.8\times$(wt.% Al) $-2.3\times$(wt.% Sn) $-6.5\times$(wt.% Si).

7. A method for producing an essentially single-phase alpha alloy which is particularly resistant to stress relaxation at elevated temperatures, said method comprising the steps of:

(a) casting an alloy consisting essentially of one component selected from the group consisting of 0.05 to 0.5% by weight magnesium or 0.05 to 0.5% by weight magnesium in combination with 0.02 to 0.5% by weight aluminum, a second component selected from the group consisting of 0.05 to 3.0% by weight silicon or 0.05 to 3.0% by weight silicon in combination with 0.1 to 2.0% by weight tin, from 8 to 32.8% by weight zinc, balance copper, with the amount of said aluminum, silicon or tin being inversely related to the amount of said zinc and with the maximum wt.% zinc $=32.8-4.8\times$(wt.% Al) $-2.3\times$(wt.% Sn) $-6.5\times$(wt.% Si);

(b) hot working said alloy at a temperature above the recrystallization temperature of the alloy and below the solidus temperature of the alloy;

(c) cold working said alloy with up to but not including a 100% reduction in area; and

(d) annealing the worked alloy at 150° to 900° C. to recrystallize the alloy to a grain size of 0.005 to 0.050 mm.

4,233,069

MODIFIED BRASS ALLOYS WITH IMPROVED STRESS RELAXATION RESISTANCE

Warren F. Smith, Jr., Branford; John M. Vitek, Cheshire, and Eugene Shapiro, Hamden, all of Conn., assignors to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 919,964, Jun. 28, 1978, abandoned. This application Nov. 5, 1979, Ser. No. 91,417

Int. Cl.³ C22C *9/04*; C22F *1/08*

U.S. Cl. 75—157.5 **15 Claims**

1. An essentially single-phase alpha alloy which is particularly resistant to stress relaxation at elevated temperatures, said alloy consisting essentially of from 0.05 to 0.5% by weight magnesium, from 0.02 to 0.5% by weight aluminum, from 8 to 32.8% by weight zinc, balance copper, with the maximum wt.% zinc$=32.8-4.8\times$wt.% aluminum.

7. A method for producing an essentially single-phase alpha alloy which is particularly resistant to stress relaxation at elevated temperatures, said method comprising the steps of:

(a) casting an alloy consisting essentially of from 0.05 to 0.5% by weight magnesium, from 0.02 to 0.5% by weight aluminum, from 8 to 32.8% by weight zinc, balance copper, with the maximum wt.% zinc$=32.8-4.8\times$wt.% aluminum;

(b) hot working said alloy at a temperature above the recrystallization temperature of the alloy and below the solidus temperature of the alloy;

(c) cold working said alloy with up to but not including a 100% reduction in area; and

(d) annealing the worked alloy at 150° to 900° C. to recrystallize the alloy to a grain size of 0.005 to 0.050 mm.

4,233,070

LEAD ALLOYS FOR ELECTRIC STORAGE BATTERY

John McWhinnie, Bolton, and John L. Dawson, Swinton, both of England, assignors to Chloride Group Limited, London, England

Filed May 23, 1979, Ser. No. 41,710

Claims priority, application United Kingdom, May 26, 1978, 22886/78

Int. Cl.² H01M *35/04*

U.S. Cl. 75—167 **8 Claims**

1. A lead alkaline earth metal alloy which consists of 0.075A/40% to 0.13A/40% by weight of at least one alkaline earth metal, 0.0001% to 0.1% aluminium, 0.005% to 0.05% by weight magnesium, the balance being lead and impurities, the alkaline earth metal being selected from the group consisting of calcium, strontium and barium and A being the atomic weight of the alkaline earth metal.

4,233,071

BEARING HAVING IRON SULFUR MATRIX

John C. Bierlein, Washington, and Edward J. Shipek, Sterling Heights, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Continuation of Ser. No. 719,857, Sep. 9, 1976, which is a continuation-in-part of Ser. No. 621,495, Oct. 10, 1975, Pat. No. 3,985,408. This application Jan. 4, 1979, Ser. No. 970

Int. Cl.³ B22F *5/00, 3/26*

U.S. Cl. 75—231 **3 Claims**

1. A bearing matrix which is a porous coherent body of sintered particles providing score resistance and adapted for lubricant impregnation, said matrix consisting by weight of ½ to 6 percent sulfur; 0 to 60 percent copper; and iron; the copper being present as desired to proportionally reduce the sintering temperature.

4,233,072

SLIDING MEMBER HAVING WEAR- AND SCUFF-RESISTANT COATING ON ITS SURFACE

Tamotu Watanabe, Kashiwazaki; Tatsuei Sakata, Nishiyama, and Yoshikuni Mizuma, Kashiwazaki, all of Japan, assignors to Riken Corporation, Tokyo, Japan

Filed Jun. 15, 1978, Ser. No. 915,592

Claims priority, application Japan, Jul. 28, 1977, 52-89762

Int. Cl.³ B22F *5/00*

U.S. Cl. 75—236 **3 Claims**

1. A sliding member having a wear resistant coating produced by plasma-arc spraying a mixture comprising 60 to 85% by weight of molybdenum powder, 10 to 30% by weight of nickel-chromium alloy powder and 5 to 20% by weight of titanium carbide powder on its sliding surface.

4,233,073

IRON-BASE SINTERED ALLOY FOR VALVE SEAT AND METHOD OF MAKING THE SAME

Kazutoshi Takemura, Kashiwazaki, Japan, assignor to Riken Piston Ring Industrial Co., Ltd., Tokyo, Japan

Filed Apr. 24, 1978, Ser. No. 899,110

Claims priority, application Japan, May 2, 1977, 52-49860

Int. Cl.² C22C *33/02, 38/38, 38/22, 38/30*

U.S. Cl. 75—243 **2 Claims**

1. Wear resistant and machinable sintered iron-base alloy especially suitable for valve seat manufacture, having a chemical composition by weight of 0.6–2.1% carbon, 1.0–8.0% chromium, 0.5–4.0% tungsten, 2.0–12.0% cobalt, 1.0–5.0% nickel and balance essentially iron, having a microstructure

comprising pearlite and globular hard alloy phase uniformly dispersed in said pearlite with martensite surrounding said hard alloy phase being formed with atomized powder of pre-alloyed hard metal having chemical composition by weight of 1.0–3.0% carbon, 20–40% chromium, 10–20% tungsten and 40–60% cobalt.

2. Method of producing sintered iron-base alloy especially suitable for valve seat manufacture, comprising the steps of mixing 5–20% by weight of pre-alloyed and atomized hard alloy powder having chemical composition by weight of 1.0–3.0% carbon, 20–40% chromium, 10–20% tungsten and 40–60% cobalt; 0.6–1.5% graphite powder, 1.0–5.0% nickel powder and remainder of iron powder; compacting the mixture into a desired shape; and sintering said compacted mixture at a temperature ranging 1100° to 1200° C., then cooling said compacted and sintered mixture to a room temperature.

4,233,074

PHOTOGRAPHIC POLYESTER FILM BASE WITH SUBBING LAYER CONTAINING PHOSPHORIC ACID DERIVATIVE

Geoffrey M. Dodwell, and Norman E. Gambles, both of Brentwood, England, assignors to Ciba-Geigy Aktiengesellschaft, Basel, Switzerland

Filed Jun. 12, 1978, Ser. No. 914,813

Claims priority, application United Kingdom, Jun. 24, 1977, 26504/77

Int. Cl.² G03C *1/78*

U.S. Cl. 430—535 **16 Claims**

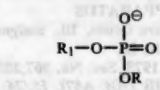
1. A method of preparing film base material consisting of biaxially oriented synthetic linear polyester which comprises stretching extruded synthetic polyester material in one direction and then coating on this material a copolymer in the form of an aqueous latex consisting essentially of

(a) 20 to 95% by weight of vinylidene chloride;

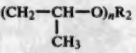
(b) 5 to 50% by weight of a plasticising comonomer selected from the group consisting of (1) an alkyl acrylate or methacrylate, where the alkyl moiety contains 1 to 6 carbon atoms (2) acrylonitrile and (3) vinyl chloride;

(c) 0 to 20% by weight of a copolymerisable acid; and

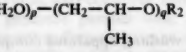
(d) 0 to 25% by weight of other comonomers different from (a) to (c) together with 10 to 40 percent by weight of solids in the latex of at least one phosphoric acid derivative of the formula



wherein M is an alkali metal, ammonium or hydrogen, R_1 is methyl, ethyl or hydrogen and R is methyl, ethyl or an ethylene oxide group of the formula $-(CH_2CH_2O)_nR_2$ or a propylene oxide group of the formula



wherein R_2 in each case is alkyl or optionally substituted acyl, aryl or aralkyl and n is 1 to 20, or a mixed ethylene oxide/propylene oxide group of the formula



where the ethylene oxide and propylene oxide moieties are arranged either in blocks or randomly in the chain and the sum of p and q is n, drying this coating and completing the orientation of the polyester film material.

4,233,075

PRESERVATIVE SOLUTION FOR MATERIAL SHINING CLOTH

Stephano Picone, 1727 Riverside Dr., Dearborn, Mich. 48120

Filed Jul. 13, 1979, Ser. No. 57,388

Int. Cl.³ C09D *3/00*

U.S. Cl. 106—3 **2 Claims**

1. A method for making a vegetable base preservative solution and its addition to material surfaces, comprising the steps of:

(a) providing a volume of water selected from the range of 3½ gallons to 4½ gallons;

(b) mixing 16 ounces of okra in said volume of water;

(c) adding a food preservative agent to the mixture of water and okra in an amount selected from the range of 2 tablespoons to 3½ tablespoons;

(d) boiling the mixture of water, okra and food preservative agent for about one hour and forty-five minutes to make a syrupy solution; and,

(e) cooling and ageing the solution for at least one month,

(f) bringing the solution to boiling and adding towels made of soft material,

(g) immersing towels in said solution for 20–25 minutes,

(h) cooling towel mixture,

(i) draining off excess solution and drying.

4,233,076

NOVEL SAND/SILICATE COMPOSITIONS FOR FOUNDRY MOLDS/CORES

Jean-Pierre Blanc, Antony, and Francois Meiller, Palaiseau, both of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Dec. 18, 1978, Ser. No. 970,793

Claims priority, application France, Dec. 19, 1977, 77 38182

Int. Cl.² B28B *7/34*

U.S. Cl. 106—38.35 **20 Claims**

1. In a moldable composition of matter comprising an intimate uniform admixture of sand, an alkali metal silicate, and at least one of a hardening agent; selected from the group consisting of an alkylene carbonate, an organic monocarboxylic or dicarboxylic acid or methyl ester thereof, carbon dioxide and blast furnace slag; the improvement comprising a demolding agent which comprises an alumina having an average grain size distribution of between 0.2 and 5μ.

4,233,077

PREPARING EXTRUDABLE REFRACTORY HARD METAL-WAX BLENDS

John G. Hazel, Barberton, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Apr. 29, 1977, Ser. No. 792,422

Int. Cl.² C04B *35/64;* C08J *3/20*

U.S. Cl. 106—43 **12 Claims**

1. A method of preparing an extrudable refractory powder composition which comprises:

(a) mixing submicron refractory powder selected from the group consisting of borides, carbides, and nitrides of metals of Groups III, IV, and V of the Periodic Table of the Elements with organic solvent that is chemically inert to the refractory powder and liquid at room temperature to form an agglomerate-free slurry of submicron refractory powder and organic solvent,

(b) mixing said slurry with between about 10 and 50 percent by weight of solvent-free powder of organic plasticizer at temperatures above the melting point of said organic plasticizer to obtain a liquid slurry, said plasticizer being solid at room temperature and a viscous liquid above 35° C., said solvent being miscible with said plasticizer at the mixing temperatures and in the proportions used,

(c) heating said slurry to remove substantially all of said solvent while avoiding vaporization of said plasticizer, and

(d) cooling solvent-depleted slurry to form a solid, agglomerate-free extrudable refractory powder composition in which the refractory powder is well dispersed.

4,233,078

REFRACTORY COMPOSITION FOR FORMING A MONOLITHIC STRUCTURE

William E. Brown, Pleasanton, Calif., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Jul. 3, 1979, Ser. No. 54,506

Int. Cl.³ C04B *35/54, 35/56*

U.S. Cl. 106—56 **6 Claims**

1. A refractory composition for forming a monolithic structure consisting essentially of (1) from 5% to 15% graphite, (2) from 0% to 20% silicon carbide, (3) from 0 to 5% carbon black, (4) from 5% to 20% clay, (5) from 1% to 5% sodium borate, (6) from 1% to 3% of an organic binder, and (7) from 1% to 12% water, the remainder of the composition being (8) refractory aggregate chosen from high alumina material and aluminosilicate material, all percentages being by weight and based on the total dry weight of the composition which composition has a substantially reduced loss of workability or plasticity during storage in a sealed container.

4,233,079

ALUMINOUS REFRACTORY COMPOSITIONS CONTAINING CARBON, SILICON AND CHROME OXIDE

Harold L. Rechter, Country Club Hills, Ill., assignor to Chicago Fire Brick Company, Chicago, Ill.

Continuation-in-part of Ser. No. 17,270, Mar. 5, 1979. This application Oct. 26, 1979, Ser. No. 88,549

The portion of the term of this patent subsequent to Jul. 1, 1980, has been disclaimed.

Int. Cl.³ C04B *35/52*

U.S. Cl. 106—56 **12 Claims**

1. In a refractory composition comprising alumina or aluminum silicate refractory material, carbon and powdered silicon, the improvement of having chromic oxide and carbon present in the composition in amount sufficient to give greater resistance to slag over that of aluminous composition in which chromic oxide and carbon are absent, said carbon being present in up to about 35%.

4,233,080

ANHYDRITE CELLULAR CONCRETE AND COMPOSITE BUILDING ELEMENTS

Robert Koeppel, Bron, France, assignor to Produits Chimiques Ugine Kuhlmann, Paris, France

Continuation of Ser. No. 852,063, Nov. 16, 1977, abandoned. This application Dec. 13, 1978, Ser. No. 969,209

Claims priority, application France, Nov. 30, 1976, 76 36028; Dec. 21, 1976, 76 38489

Int. Cl.³ C04B *11/06, 11/14*

U.S. Cl. 106—87 **16 Claims**

1. A method of producing cellular concrete from a binder, water, and a porogenic system which comprises, forming a composition of an insoluble anhydrite binder together with aluminum powder and an alkaline agent reactive with the aluminum to produce a gas, and an anhydrite setting catalyst, inserting the composition into a mold, and permitting the composition to expand and harden into a cellular concrete, said anhydrite being characterized by a granulometry having at least about 15% by weight of particles of a diameter less than about 10 μm and at least about 20% by weight of particles having a diameter larger 20 μm with an average diameter of between about 5 and about than about 30 μm, the anhydrite likewise being characterized by a Blaine surface area between about 1000 and about 8000 sq. cm/g.

4,233,081

PROCESS FOR DISPERSING FINELY DIVIDED PARTICLES IN AN AQUEOUS MEDIUM

Lucien Plumet, Vilvoorde, Belgium, assignor to Solvay & Cie., Brussels, Belgium

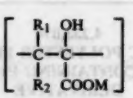
Filed Feb. 11, 1976, Ser. No. 657,101

Claims priority, application Luxembourg, Feb. 17, 1975, 71867

Int. Cl.³ C09D *3/20, 3/36, 5/02;* C08L *33/08*

U.S. Cl. 106—214 **30 Claims**

1. In a painting composition obtained by dispersing finely divided water-insoluble particles in an aqueous medium by using as dispersing agent a salt of a carboxylated polymer, the improvement wherein the dispersing agent used comprises a salt of a polymer derived from an alpha-hydroxyacrylic acid, which salt contains at least 50 mol % of units of the formula



wherein R_1 and R_2 independently represent hydrogen or an alkyl group containing 1 to 3 carbon atoms and wherein M represents a cationic radical resulting from the dissociation of a base.

4,233,082

PLASTICIZED SULFUR COATING COMPOSITION

Milutin Simic, Novato, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 601,552, Aug. 4, 1975, abandoned. This application Dec. 9, 1976, Ser. No. 749,143

Int. Cl.³ C08K *3/06, 5/41*

U.S. Cl. 106—287.23 **5 Claims**

1. A composition of matter comprising at least 50 weight percent sulfur; from 0.05 to 15 weight percent an aliphatic linear polysulfide sulfur plasticizer; from 0.5 to 25 weight percent an aromatic polymeric polysulfide formed by reacting one mol of phenol with at least two mols of sulfur; and from about 2 to 25 weight percent an inorganic filler selected from mica and asbestos.

4,233,083

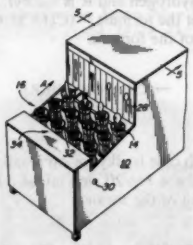
PRESORTED FLATWARE WASHING METHOD AND APPARATUS

Donald E. Roberts, Downers Grove, Ill., assignor to Hillside Engineering, Inc., Hillside, Ill.

Filed Dec. 7, 1978, Ser. No. 967,207

Int. Cl.³ B08B *7/04;* A47L *15/24*

U.S. Cl. 134—25.2 **9 Claims**



1. Flatware washing apparatus comprising in combination,
a loading station,
a processing station for washing articles passed therethrough,
a discharge station,
a plurality of perforated washing containers for holding

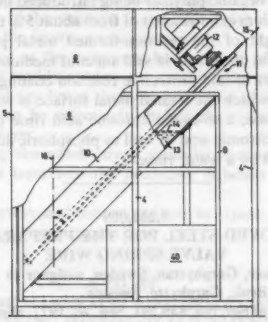
pieces of flatware in a substantially upright position,
driven endless conveyor means attached to said containers for moving said containers through a closed circuit from station to station so as to cause flatware placed in said containers at said loading station to be moved through said washing station to said discharge station in a substantially upright condition,
a plurality of flatware receiving receptacles for receiving said pieces of flatware,
discharge means located at said discharge station for automatically discharging said flatware from each of said containers into respective ones of said receptacles,
each of said containers comprising a generally cylindrical body portion having an outwardly flared top portion and a bottom having a generally convex upper surface spaced from the lower edge of said cylindrical body portion,
means hingedly connecting said bottom to said cylindrical body portion,
a cam follower carried by said bottom, and
cam track means located at said loading and washing stations for cooperating with said cam follower to hold said bottom in a flatware holding position beneath said cylindrical body portion as said containers move through said loading and washing stations,
whereby soiled flatware may be sorted as it is loaded into said containers at said loading station and is thereafter automatically washed and discharged through the bottoms of said containers in the sorted condition into said receptacles.

4,233,084

DEVICE FOR TREATMENT OF ARTICLES WITH AT LEAST ONE TREATMENT AGENT

Karl A. Bergsand, Floda, Sweden, assignor to Göteborgs Maskinkonsult AB, Sweden

Filed Dec. 11, 1978, Ser. No. 968,559
Int. Cl.[3] B08B *3/04*
U.S. Cl. 134—67 **14 Claims**



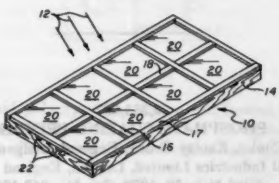
1. A device for treatment of articles with at least one treatment agent, comprising at least one conveyor module for transporting articles through at least one treatment zone where the articles are exposed to treatment with at least one treatment agent, said conveyor module comprising a conveyor having two runs, a first run for lowering articles into the treatment zone and a second run for raising articles out of the treatment zone, said runs being interconnected in the treatment zone and generally being located in a conveyor plane oriented at an angle relative to the vertical; said conveyor being of the endless type having two generally parallel runs; the conveyor module comprising adjacent to the conveyor an article support having a support face generally parallel to the conveyor plane and being located so as to allow articles to be moved by means of the conveyor along the support face; said support face having passages to allow passage of treatment agent from one side to the other; and the angle between the conveyor plane and the vertical being greater than 30° but less than 60°; the treatment zone being located within a container having an opening for the conveyor module; said container being provided with a partition dividing the container into a larger and a smaller compartment, the conveyor module extending through the larger compartment and with its lower end into the smaller compartment, there being provided different treatment agents in the two compartments.

4,233,085

SOLAR PANEL MODULE

Guy A. Roderick, and Peter Locke, both of El Paso, Tex., assignors to Photon Power, Inc., El Paso, Tex.

Filed Mar. 21, 1979, Ser. No. 22,418
Int. Cl.[2] H01L *31/04*
U.S. Cl. 136—244 **16 Claims**



1. Apparatus forming a solar panel module from a plurality of solar panel units each with a transparent vitreous substrate having a first surface adapted for receiving incident solar radiation and a second opposite surface supporting a plurality of CdS-type photovoltaic cells in a back-wall configuration electrically interconnected by an outer conductive layer, comprising:
a frame assembly resistant to environmental exposure and defining surfaces for supporting edge portions of said substrate;
means flexibly securing said solar panel units on said support surfaces; and
an electrically insulating film disposed over said outer conductive layer of each said solar panel unit,
said frame and said insulating frame cooperating to form an insulated mounting for each solar panel unit of said module.

7. An improved photovoltaic panel comprising a plurality of CdS-type photovoltaic cells in a back-wall configuration on a transparent vitreous substrate and interconnected by an outer conductive layer, the improvement comprising:
a bituminous layer contacting said outer conductive layer to a depth effective to seal said photovoltaic cells from environmental contaminants and to form an insulated external surface adjacent said conductive layer.

4,233,086

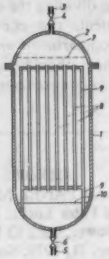
METHOD FOR PROVIDING A DIFFUSION BARRIER

Gunnar Vesterlund, Vasteras, Sweden, assignor to AB Asea-Atom, Vasteras, Sweden

Filed Nov. 28, 1978, Ser. No. 964,192
Int. Cl.[2] G21B *3/06*; C23F *7/02*
U.S. Cl. 148—6.3 **6 Claims**

1. A method for manufacturing a diffusion resistant, copper clad, zirconium alloy tube comprising:
furnishing a tube constructed of a zirconium alloy material;
depositing a copper lining on at least the internal surfaces of said tube; and

contacting at least the internal copper-lined surfaces of the tube with steam at a temperature in the range of 200 to



550° C. until a barrier of zirconium oxide is formed between the copper lining and the zirconium-based alloy.

4,233,087

PHOSPHATE COATING PROCESS

Brian A. Cooke, Knotty Green, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Nov. 20, 1978, Ser. No. 962,482

Claims priority, application United Kingdom, Nov. 29, 1977, 49608/77

Int. Cl.[2] C23F 7/10, 7/12

U.S. Cl. 148—6.15 Z **8 Claims**

1. A continuous process of applying a phosphate coating to a ferrous or zinciferous metal substrate by treating the said substrate with an acidic phosphating solution of zinc phosphate in the presence of hydrogen peroxide or of a hydrogen peroxide-liberating substance wherein the phosphating solution comprises:

(a) 0.005–0.5 g.atoms of zinc (Zn) per liter of solution.

(b) 0.0002–0.02 g.moles of hydrogen peroxide per liter of solution and

(c) orthophosphate (PO_4) such that the molar ratio PO_4/Zn in solution is in the range 0.5–3.7, and wherein, as phosphating proceeds, the solution is replenished with hydrogen peroxide or with a hydrogen peroxide-liberating substance and with at least two other replenishment feeds, replenishment feed (i) and replenishment feed (ii), to maintain the solution at a desired composition and defined in (a), (b) and (c) above and wherein:

replenishment feed (i) comprises sufficient zinc (Zn) to maintain the desired concentration (a) in the solution, and sufficient orthophosphate (PO_4) together with another anion N^{n-} to maintain the molar ratio PO_4/Zn in the solution within the range defined in (c), the replenishment feed (i) having a free acidity of F gram equivalents/Kg of the said feed, and replenishment feed (ii) comprises an alkaline material selected from the group consisting of the hydroxides, carbonates and bicarbonates of alkali and alkaline earth metals, said alkaline material being soluble in water at the concentration of said replenishment feed (ii) and has a total alkalinity of A gram equivalents/Kg of replenishment feed (ii);

the ratio of the quantities of replenishment feeds (ii) and (i) respectively with are added to the phosphating solution within a significant period of time being (XF/A) where the value of X is in the range 0.5–1.5, and the anion N^{n-} being selected such that the acid H_nN has a pK_a value in the nth dissociation step not greater than 3.

4,233,088

PHOSPHATIZATION OF STEEL SURFACES AND METAL-COATED SURFACES

Max Kronstein, Bronx, N.Y., assignor to International Lead Zinc Research Organization, Inc., New York, N.Y.

Filed Mar. 29, 1979, Ser. No. 24,966

Int. Cl.[3] C23F 7/10, 7/12

U.S. Cl. 148—6.16 **21 Claims**

1. A process for inhibiting corrosion, providing an adherent foundation, and, in the case of a zinc-coated surface, eliminating the irregular appearance due to a surface condition which is usually described as the formation of a "spangle" pattern, by pretreating metal surfaces for subsequent application of organic coating systems which comprises

treating a metal surface with a phosphatizing bath comprising a reactive aqueous solution or dispersion prepared by introducing a metal oxide of a metal other than the metal of the metal surface to be treated into an aqueous medium containing phosphate ions released from the dissolving or dispersing of an alkali metal phosphate or an alkali metal acid phosphate or phosphoric acid or combinations thereof and introducing a ligand-forming organic polymer into said aqueous medium; said introduced metal oxide being an oxide of a metal selected from the group consisting of molybdenum, vanadium, tungsten, lead, titanium, manganese and copper; and said metal oxide being introduced in an amount approximately stoichiometric with said phosphate ions;

whereby there is formed in said aqueous medium a metal phosphate or a metal acid phosphate of the introduced metal oxide by reaction between the introduced metal oxide and the phosphate ions which is capable of interreacting with the metal of the metal surface being treated and resulting in a protective reaction coating comprised of the metal component of the introduced metal oxide as well as of the metal of the treated metal surface together with the phosphate ions of the phsophatizing bath; said ligand-forming organic polymer being introduced into said aqueous medium in an amount of from about 5% to about 10% by weight of the reaction-formed metal phosphate or metal acid phosphate in said aqueous medium and becoming a part of said protective reaction coating;

following which the treated metal surface is washed with a water rinse, a so-called chromic acid rinse or rinse containing chromic acid as well as phosphoric acid and again followed by a water rinse.

4,233,089

LOW-ALLOYED STEEL FOR THE PREPARATION OF VALVE SPRING WIRE

Christer Lanner, Garphyttan, Sweden, assignor to Aktiebolaget Garphytte Bruk, Garphytte, Sweden

Continuation of Ser. No. 835,281, Sep. 20, 1977, abandoned. This application Nov. 13, 1978, Ser. No. 959,617

Claims priority, application Sweden, Sep. 20, 1976, 7610405

Int. Cl.[3] C22C 38/06

U.S. Cl. 148—36 **4 Claims**

1. Valve spring wire of low-alloyed steel, characterized in that the wire has been oil hardened and tempered and in that the steel consists essentially of the following composition, expressed in weight percent:

C	0.5	1.0%
Si	0.1	1.5%
Mn	1.0	2.0%
Al_{tot}	0.01	0.05%
N	0.004	0.020%

the remainder being iron as well as normally occuring impurities.

4,233,090

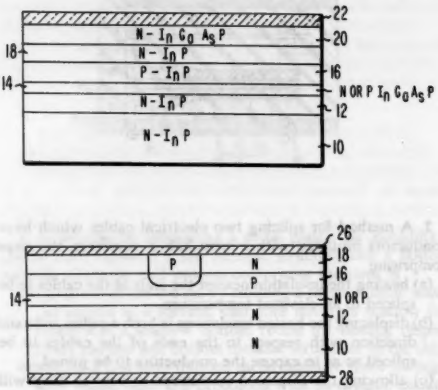
METHOD OF MAKING A LASER DIODE

Frank Z. Hawrylo, Trenton, and Henry Kressel, Elizabeth, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Jun. 28, 1979, Ser. No. 52,787

Int. Cl.³ H01L *21/208*

U.S. Cl. 148—171 **6 Claims**



1. In a method of making a semiconductor laser in which a plurality of layers of single crystal semiconductor material are epitaxially deposited in succession on a substrate to form an active region having heterojunctions on each side thereof and a conductivity modifier is diffused along a narrow stripe into the outermost of the epitaxial layers to a depth adjacent the active region, the improvement comprising:

(a) depositing as the outermost layer a layer of a material which (1) readily accepts the conductivity modifier, (2) has a band-gap lower than the preceding adjacent layer, and (3) can be selectively etched from the preceding adjacent layer,

(b) diffusing the conductivity modifier through the said outermost layer into the preceding adjacent layer, and then

(c) etching away said outermost layer to expose the surface of the preceding adjacent layer.

4,233,091

METHOD OF MANUFACTURING SEMICONDUCTOR DEVICES HAVING IMPROVED ALIGNMENT MARKS

Yunosuke Kawabe, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Aug. 31, 1979, Ser. No. 71,085

Int. Cl.² H01L *21/20, 21/302, 21/76*

U.S. Cl. 148—175 **4 Claims**

1. A method of manufacturing a semiconductor device of a V-groove isolation structure type havng an alignment mark, said method comprising the steps of:

forming an oxide layer on an epitaxial layer which is formed on a semiconductor substrate;

forming an oxidation resistant masking layer on said oxide layer;

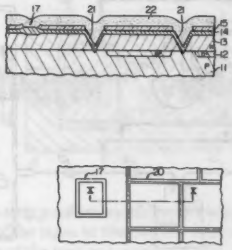
selectively etching said masking layer to expose a part corresponding to a V-groove forming area and a part corresponding to an alignment mark area of said oxide layer;

selectively etching said exposed part corresponding to said V-groove forming area of said oxide layer to expose a part of said epitaxial layer;

anisotropically etching said exposed part of the epitaxial layer to form a V-groove;

oxidizing the surface of said V-groove and a part of said epitaxial layer which lies under said exposed part of said oxide layer corresponding to said alignment mark area;

filling said V-groove with polycrystalline silicon;



Oxidizing said polycrystalline silicon and further oxidizing said part of said epitaxial layer which lies under said exposed part of said oxide layer to form said alignment mark; and

removing the remaining masking layer.

4,233,092

UTILIZING LEAD COMPOUNDS OF SULPHUR, SELENIUM AND TELLURIUM AS DOPANT SOURCES

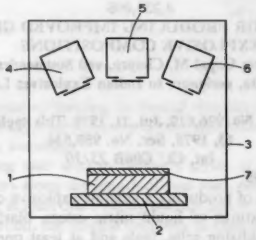
Jeffrey J. Harris, Crawly, England, and Colin E. C. Wood, Freeville, N.Y., assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 12, 1979, Ser. No. 74,617

Claims priority, application United Kingdom, Sep. 22, 1978, 37800/78

Int. Cl.² H01L *21/203, 29/207*

U.S. Cl. 148—175 **3 Claims**



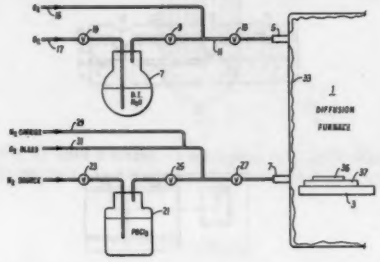
1. A method of growing an n-type GaAs layer on a substrate by molecular beam epitaxy comprising the step of directing respective molecular beams of gallium, arsenic and a compound defined by PbX onto a heated substrate surface, wherein X represents one of the elements sulphur, selenium and tellurium.

4,233,093

PROCESS FOR THE MANUFACTURE OF PNP TRANSISTORS HIGH POWER

Pei Chow, Jefferson Square Apts.-12A, 13000 NW. Cornell Rd., Portland, Oreg. 97229

Filed Apr. 12, 1979, Ser. No. 29,269
Int. Cl.³ H01L 21/225
U.S. Cl. 148—189 5 Claims



1. In the process of making PNP high power transistors wherein a silicon wafer is predoped with a N-type impurity such as phosphorus and the wafer heated in a base diffusion step to diffuse the dopant into the body of the silicon, the improvement comprising carrying out said diffusion step in a heated reaction vessel wherein the walls of the vessel have been first precoated with phosphorus.

4,233,094

EXPLOSIVE COMPOSITION FORMING NO WATER AS A REACTION PRODUCT DURING DETONATION

Calvin J. Konya, 6990 Summers Rd., Huntsburg, Ohio 44046

Filed Jan. 15, 1979, Ser. No. 3,365
Int. Cl.³ C06B 33/04
U.S. Cl. 149—43 5 Claims

1. A water-free and hydrogen-free explosive composition consisting essentially of, in percent by weight, 65 to 73% sodium nitrate, 21 to 35% powdered aluminum and up to 6% carbon black, said explosive composition being oxygen balanced and forming no water as a reaction product during detonation.

4,233,095

METHOD FOR PRODUCING IMPROVED GELATINE EXPLOSIVE COMPOSITIONS

Bidhan C. Ghosh; Gopal M. Chopra, and Soumendra N. Sen, all of Bihar, India, assignors to Indian Explosives Limited, Calcutta, India

Division of Ser. No. 926,610, Jul. 21, 1978. This application Nov. 13, 1978, Ser. No. 959,534
Int. Cl.² C06B 25/30
U.S. Cl. 149—95 19 Claims

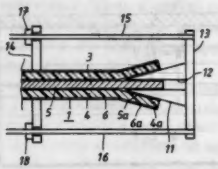
1. A method of producing a gelatine explosive composition comprising mixtures of liquid nitric esters, blasting soluble nitrocotton, oxidizing salts, fuels and at least one dispersing agent with a marked reduction in the quantities of liquid nitric esters and blasting soluble nitrocotton content, the method comprising the steps of adding at least one of said dispersing agent to said liquid nitric esters, adding the resulting mixtures to said blasting soluble nitrocotton in a conventional mixer for the formation of a gel and subsequently adding said oxidizing salts and said fuels to form a homogenous mixture.

4,233,096

CABLE SPLICING METHOD WITH REDUCED WASTE OF CROSS-LINKED POLYMER INSULATION

Karl-Gunnar Wiberg, Stockholm, Sweden, assignor to ASEA Aktiebolag, Västerås, Sweden

Filed Feb. 14, 1979, Ser. No. 12,242
Claims priority, application Sweden, Feb. 17, 1978, 7081832
Int. Cl.³ B21F 15/02; B65N 69/02; B29C 19/00
U.S. Cl. 156—49 9 Claims



1. A method for splicing two electrical cables which have conductors insulated with a cross-linked polymers, the steps comprising

(a) heating the insulation nearest the ends of the cables to be spliced to an elevated temperature,

(b) displacing the heated insulations in both a radial and axial direction with respect to the ends of the cables to be spliced so as to expose the conductors to be joined,

(c) allowing the displaced insulations to cool so they will retain their displaced forms,

(d) joining the ends of the conductors of the cables to be spliced, and

(e) reheating the displaced insulations such that they will return to substantially their original shape and position around the respective conductors.

4,233,097

METHOD OF MAKING A FLEXIBLE PLASTIC TUBE

Eugen H. Stahl, Böttingen, Fed. Rep. of Germany, assignor to Hans Grohe GmbH & Co. KG, Fed. Rep. of Germany

Division of Ser. No. 906,757, May 17, 1978, Pat. No. 4,172,474. This application Mar. 19, 1979, Ser. No. 21,888
Claims priority, application Fed. Rep. of Germany, May 20, 1977, 2722928
Int. Cl.³ B31C 13/00; F16L 11/08
U.S. Cl. 156—143 2 Claims

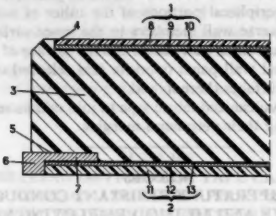
1. A method of forming a composite plastic tube, comprising, extruding an inner tubular wall portion, winding a continuous length of a U-shaped reinforcing strip around the inner tubular wall portion in successive spiral turns which are axially spaced apart, said reinforcing strip of U-shape configuration having side walls which define a first cavity therebetween over said reinforcing strip and a second cavity between sidewalls of adjacent strips, said side walls each having a radially diverging outwardly tapering cross-sectional shape symmetrically diverging from the radial median plane of said strip, by which the cross-sectional shape of said second cavity is tapered in the radially outward direction, and applying an outer tubular wall by extruding it over the reinforcing strip so as to join it to the side walls of said reinforcing strip.

4,233,098

METHOD OF MAKING METAL-PLASTIC SKI

Daniel Urbain, Thionville, France, assignor to Laminoirs a Froid de Thionville, Thionville, France

Filed Mar. 24, 1978, Ser. No. 889,867
Claims priority, application France, Mar. 24, 1977, 77 08881
Int. Cl.[2] A63C 5/12
U.S. Cl. 156—242 9 Claims



1. A process for fabricating a metal plastic ski including a plastic core between a top metallic structure and a bottom metallic structure, said process comprising the steps of

forming a core for the ski by molding a thermoplastic material soluble in a solvent, said core having a shallow top recess and a shallow bottom recess for nesting respectively the top and bottom metallic structures of the ski;

obtaining a first semi-finished metal laminate sheet having a high elastic limit and precoated with an organic coating on each surface thereof by a continuous coating process during which said sheet is cleaned, chemically treated, coated on one surface with a protective coating constituting the upper covering of the ski, coated on its other surface with an intermediary gluing layer of a substance soluble in at least said solvent and said coatings are cured;

obtaining a second semi-finished metal laminate sheet having a high elastic limit and precoated with an organic coating on each surface thereof by a continuous coating process during which said second sheet is cleaned, chemically treated, coated on one surface with a material constituting the runner surface of the ski, coated on its other surface with an intermediary layer of a substance soluble in at least said solvent, and said coatings are cured;

cutting said first and second semi-finished metal laminates to predetermined profiles, similar respectively to profiles of said top and bottom recesses, to form said top and bottom metallic structures of the ski;

applying to said intermediary gluing layers of said top and bottom structures a cold glue comprising at least said solvent; and

nesting said top and bottom structures in said top and bottom recesses of said core and pressing said structures against said core to form a ski.

4,233,099

SLIDE FASTENER METHOD OF MANUFACTURE

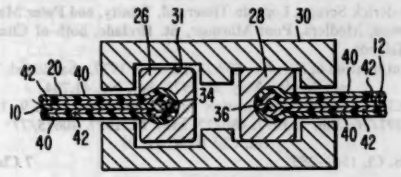
Ned W. McGuire, Meadville, Pa., assignor to Textron Inc., Providence, R.I.

Division of Ser. No. 859,671, Dec. 12, 1977, Pat. No. 4,156,303. This application Dec. 20, 1978, Ser. No. 971,582
Int. Cl.[2] A44B 19/24
U.S. Cl. 156—242 5 Claims

1. A method of forming a reinforcing and finishing strip on the ends of textile tapes of a slide fastener comprising the steps of

superimposing reinforcing and finishing strip portions on at least one of the front and back sides of end portions of the tapes, the strip portions having an inner layer facing the textile tapes and an outer film laminated to the inner layer, the outer film consisting of a nylon 6 having a melting temperature substantially greater than 163° C., and the inner layer consisting of a blend of a nylon 6 and nylon 6—6 having a melting temperature within the range from 148° to 163° C.,

engaging the outer film of the strip portions with a heated tool having a temperature within the range from 148° to 163° to heat the strip portion to the melting temperature of the inner layer but below the melting temperature of the outer film, and



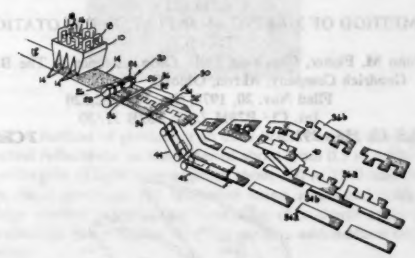
pressing the strip portions by means of the tool onto the end portions of the tapes so that the inner layer is molded into interstices of the tape end portions and in intimate contact with substantial surface portions of the fibers of the tape end portions to securely bond the strip portions to the at least one side of the end portions of the tape with the outer film remaining coherent and generally uniform in thickness.

4,233,100

METHOD AND APPARATUS FOR MANUFACTURING A LAMINATED SHINGLE

Richard N. Cunningham; Douglas D. Smith, both of Jefferson County, Colo., and Romain E. Loeffler, deceased, late of Jefferson County, Colo. (by Carolyn R. Loeffler, legal representative), assignors to Johns-Manville Corporation, Denver, Colo.

Filed Jul. 2, 1979, Ser. No. 54,198
Int. Cl.[2] B32B 31/00
U.S. Cl. 156—260 19 Claims



1. A method of forming laminated shingles comprising:

(a) providing a substantially continuous web of composition shingle material;

(b) cutting said web to define a series of sets of shingle members along the length of said web, each said set comprising at least one overlay portion and at least one underlay portion, the shingle members in each said set having a predetermined positional relationship with one another in said series;

(c) separating said members defined in step (b) from one another while maintaining the members in said sets and maintaining said sets in said series;

(d) conveying said sets to a laminating work station;

(e) laminating each said underlay portion in a set to an over-

lay portion from the same set to form a laminated shingle; and

(f) collating the shingles formed in step (e) to form stacks of shingles having a predetermined number of shingles in each stack.

4,233,101

METHOD OF LINING A PIPE

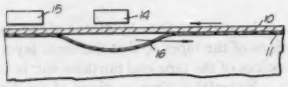
Frederick Scragg, Loge du Tisseraud, Trinity, and Peter Marshman, Medlers, Pont Marquet, St. Brelade, both of Channel Islands

Continuation of Ser. No. 859,232, Dec. 9, 1977, abandoned. This application May 23, 1979, Ser. No. 41,784

Claims priority, application United Kingdom, Dec. 9, 1976, 51392/76; Jan. 7, 1977, 480/77; May 17, 1977, 20615/77

Int. Cl.³ B29C *17/07*

U.S. Cl. 156—287 **7 Claims**



1. A method of lining a pipe comprising applying a nontacky adhesive layer to the inner surface of the pipe, the adhesive being capable of being heat activated at a first temperature value, to cause it to become tacky, inserting in the pipe a film of thermoplastic material to overlie the nontacky adhesive layer on the inner surface of the pipe, applying a uniform purely radial force to said thermoplastic material, while the adhesive is still nontacky, heating the assembly in an axially progressive manner, by affecting relative axial displacement between the pipe and a source of heat to raise the temperature to a value below said first temperature value to render the thermoplastic film to a plastic state and then heating the assembly at least to said first value to activate the adhesive and cause it to adhere to the thermoplastic film.

4,233,102

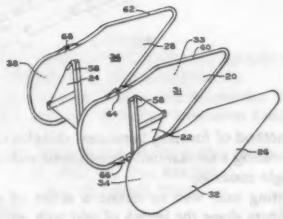
METHOD OF MAKING AN INFLATABLE FLOTATION DEVICE

John M. Fisher, Cuyahoga Falls, Ohio, assignor to The B. F. Goodrich Company, Akron, OhioIO

Filed Nov. 20, 1978, Ser. No. 962,520

Int. Cl.² B29H *7/03;* **B32B** *31/20*

U.S. Cl. 156—292 **2 Claims**



1. A method of making in inflatable emergency flotation bag having an inflation chamber divided into a plurality of fluidly independent subchambers, the method comprising the steps of:

(A) forming a pair of similarly sized and contoured outer wall panels from vulcanized rubber coated fabric sheet;

(B) forming an inner longitudinal wall panel of a size and contour similar to said outer wall panels from vulcanized rubber coated fabric sheet;

(C) forming at least two similarly shaped transverse wall members from vulcanized rubber coated fabric sheet;

(D) using unvulcanized rubber coated fabric tape to adhere selected peripheral portions of one of said at least two transverse wall members to the inner surface of one of the outer wall panels and a selected one of the opposite surfaces of said inner longitudinal wall panel;

(E) using unvulcanized rubber coated fabric tape to adhere selected peripheral portions of the other of said at least two transverse wall members to the inner surface of the other of said outer wall panels and the surface of said inner longitudinal wall panel opposite said selected one of the opposite surfaces thereof; and

(F) using unvulcanized fabric tape to join said panels to each other along their peripheral margins.

4,233,103

HIGH TEMPERATURE-RESISTANT CONDUCTIVE ADHESIVE AND METHOD EMPLOYING SAME

Joseph M. Shaheen, La Habra, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 20, 1978, Ser. No. 971,580

Int. Cl.² C09J *5/00;* **B32B** *31/00*

U.S. Cl. 156—331 **5 Claims**

1. A method for bonding a semiconductor die to a substrate which comprises applying to the substrate a film of an adhesive formulation comprising an alloy of gallium-tin eutectic and gold dispersed in a solution of a polyimide resin; positioning a semiconductor die in contact with the film; pressing the die firmly in place; and curing the adhesive formulation to a solid bond material.

3. A high temperature-resistant, conductive adhesive composition comprising a mixture of (1) an alloy of gallium-tin eutectic and gold and (2) a polyimide resin.

4,233,104

AUTOMATIC WEB SPLICING AND FEEDING APPARATUS

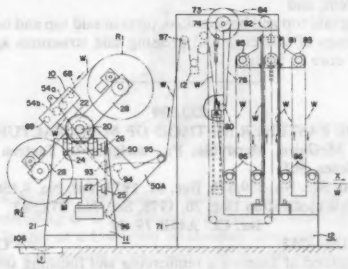
Rikio Fujishima; Kunisuke Nishihara, both of Zama, and Hideo Hosoi, Naritahigashi, all of Japan, assignors to Toshiba Kikai Kabushiki Kaisha and Dai Nippon Insatsu Kabushiki Kaisha, both of Tokyo, Japan

Filed Aug. 31, 1979, Ser. No. 71,692

Claims priority, application Japan, Sep. 8, 1978, 53/110320

Int. Cl.³ B65H *19/08, 19/18*

U.S. Cl. 156—504 **9 Claims**



1. An automatic web splicing and feeding apparatus comprising:

a web feeder including supporting means, a rotary shaft with both ends thereof rotatably supported by said supporting means, a pair of spaced apart web roll holding arms with their central portions fitted to said rotary shaft, two pairs of push members secured to opposing surfaces of said arms near the extreme ends thereof for detachably holding

both ends of hollow shafts of two web rolls, lever members mounted on said rotary shaft on the outside of said arms, automatic web splicing means supported by said lever members for bonding the trailing end of the web of one of said two web rolls to the leading end of the web of the other web roll, and means for driving said rotary shaft so as to move one of said two pairs of push members to a web working position;

web storing means for storing said web supplied from said web splicing means and for feeding said web therefrom to web working means located downstream of said web storing means; and

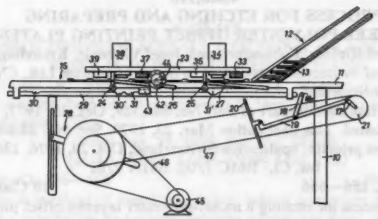
means for determining direction and angle of rotation of said rotary shaft.

4,233,105

LABELLING DEVICES FOR TAPE CASSETTES INCLUDING AN ADHESIVE APPLYING DEVICE, LABEL APPLYING DEVICE, A PRESSURE DEVICE, AND A TURN OVER ROLL

Rolf Albinger, Alte Landstrasse 40, 6314 Unterägeri, Switzerland

Filed Sep. 4, 1979, Ser. No. 72,211
Int. Cl.[3] B32B *31/00*; B65C *9/00, 11/04*
U.S. Cl. 156—559 **18 Claims**



1. A labelling apparatus for tape cassettes comprising a magazine for the cassettes, a feed path for the cassettes, means for successively feeding the cassettes from said magazine to said feed path and for advancing said cassettes stepwise along said feed path, a carrier disposed above said feed path, an adhesive applying device mounted on said carrier, a label applying device mounted on said carrier, a pressure applying device mounted on said carrier, said adhesive applying device, label applying device and pressure applying device being mounted on said carrier in succession in the direction of advance of said cassettes along said feed path, carrier raising and lowering means associated with said cassette feeding means operable to hold said carrier in a raised position relative to said feed path during the advance of said cassettes and to lower said carrier towards said feed path when said cassettes are stationary on said feed path whereby in the lowered position of said carrier said adhesive applying device applies adhesive to a first cassette on the feed path, said label applying device applies a label to the applied adhesive on a second cassette on the feed path and said pressure applying device applies pressure to the applied label on a third cassette on the feed path.

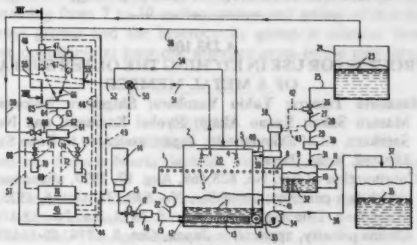
4,233,106

METHOD FOR ION CONTROL OF SOLUTIONS

Daniel L. Goffredo, Riverton, N.J., assignor to Chemcut Corporation, State College, Pa.

Division of Ser. No. 865,859, Dec. 30, 1977. This application Jul. 9, 1979, Ser. No. 55,990
Int. Cl.[2] C23F *1/02*
U.S. Cl. 156—627 **2 Claims**

1. In a method of treating articles with an etchant or other treatment solution, wherein a chamber is provided for treating articles therein, wherein treatment solution is delivered to articles in said chamber, wherein the ion concentration of the treatment solution is detected in a sensor cell and communicated to a regulator for controlling the amount of an ion-corrective fluid that is added to the treatment solution to compensate for deviation from desired ion concentration so detected, the improvement comprising, shutting off the supply of treat-



ment solution to the sensor cell, providing replenisher treatment solution to the sensor cell for cleaning the cell, then rinsing the cell with water, then passing a standardizing solution of known ion concentration through the cell and recalibrating the regulator against the solution of known ion concentration.

4,233,107

ULTRA-BLACK COATING DUE TO SURFACE MORPHOLOGY

Christian E. Johnson, Sr., Middletown, Md., assignor to The United States of America as represented by the Secretary of Commerce, Washington, D.C.

Filed Apr. 20, 1979, Ser. No. 31,706
Int. Cl.[3] C23F *1/00*
U.S. Cl. 156—632 **17 Claims**

17. A method of producing an ultra-black coating, having a spectral reflectance on the order of about from 0.5 to 1.0% at wavelengths of light ranging from about 320 to 2140 nanometers, on a substrate, the blackness being associated with a unique surface morphology consisting of a dense array of microscopic pores etched into the surface, said method comprising:

(a) preparing a substrate selected from the group consisting of a metal, a ceramic, glass and a plastic for plating with a nickel-phosphorus alloy;

(b) immersing the thus-prepared substrate in an electroless plating bath maintained at a pH of about from 3.5 to 6.5, at a temperature ranging from about 50° C. to 100° C., and containing nickel and hypophosphite ions in solution, for about from 15 minutes to 2 hours whereupon an electroless nickel-phosphorus alloy coating, containing about from 3.7 to 12.2 mass percent of phosphorus, is deposited on the substrate;

(c) removing the resulting substrate, coated with the electroless nickel-phosphorus alloy, from the plating bath and washing and drying it;

(d) immersing the dried substrate, coated with the electroless nickel-phosphorus alloy obtained in step (c), in a bath containing one part water and one part concentrated nitric

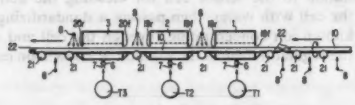
acid at a temperature of about 50° C. for about from 5 to 15 seconds whereupon the substrate surface coating develops ultra-blackness, said blackness being associated with the morphology described above; and

(e) washing and drying the resulting substrate covered with the nickel-phosphorus alloy coating having the ultra-black surface with the aforedescribed morphology.

4,233,108
PROCESS FOR USE IN ETCHING THE OUTER SURFACE OF A METAL MEMBER

Masamitu Tamura; Yukio Yasuhara; Shigeharu Nakamura; Masaru Sakai; Kazuo Akagi; Ryohei Kazihata, and Norio Satohara, all of Shimonoseki, Japan, assignors to Kobe Steel, Limited, Kobe, Japan

Continuation of Ser. No. 825,469, Aug. 17, 1977, abandoned, which is a continuation of Ser. No. 620,231, Oct. 6, 1975, abandoned. This application Mar. 5, 1979, Ser. No. 17,374
Claims priority, application Japan, Oct. 5, 1974, 49-114872
Int. Cl.² C23F *1/00*
U.S. Cl. 156—639 **6 Claims**



1. An etching process for use in chemically etching the outer surface of a metal member in a plurality of tanks including inlet and outlet openings in the front and rear opposed walls thereof, comprising the steps of:

positioning said plurality of tanks in series and aligning said inlet and outlet openings of said tanks, respectively;

disposing an etching treating solution within each of said plurality of tanks;

feeding said metal member though said inlet and outlet openings of said tanks and through said tanks in a direction parallel to the longitudinal axis of said member while rotating the same about said longitudinal axis thereof;

immersing said metal member in said etching treating solution within each of said plurality of tanks;

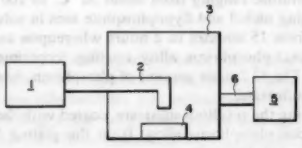
forceably conducting etching treating solution in the axial direction of feeding of said metal member within each of said tanks; and

independently feeding said metal member through said inlet and outlet openings and through said tanks in a continuous and sequential manner while rotating said metal member.

4,233,109
DRY ETCHING METHOD

Junichi Nishizawa, Sendai, Japan, assignor to Zaidan Hojin Handotai Kenkyu Shinkokai, Sendai, Japan

Continuation-in-part of Ser. No. 759,120, Jan. 13, 1977, abandoned. This application Jul. 12, 1978, Ser. No. 924,066
Claims priority, application Japan, Jan. 16, 1976, 51/4469; Aug. 27, 1976, 51/102825; Aug. 27, 1976, 51/102826
Int. Cl.³ C23F *1/00*; H01L *21/306*; B44C *1/22*; C03C *15/00*
U.S. Cl. 156—643 **37 Claims**



1. A dry etching method performed in a processing chamber containing at least one workpiece therein, said method comprising the steps of:

(1) preliminarily evacuating said processing chamber above a first predetermined degree of vacuum to remove residual gas from said processing chamber;

(2) generating plasma reaction gas containing component particles not required for the etching and component particles required for the etching;

(3) directing at least part of said component particles required for the etching to move substantially linearly to collide with said at least one workpiece in one direction;

continuously evacuating said processing chamber to a second predetermined degree of vacuum lower than said first predetermined degree of vacuum and

thereby performing at least partially reactive directional etching of said workpiece.

4,233,110
PROCESS FOR ETCHING AND PREPARING NICKEL-POLYESTER OFFSET PRINTING PLATES

Siegfried Richter, Fullinsdorf, and Josef Vinkovic, Kreuzlingen, both of Switzerland, assignors to Swiss Aluminum Ltd., Chippis, Switzerland

Continuation-in-part of Ser. No. 846,329, Oct. 23, 1977, abandoned. This application Mar. 23, 1979, Ser. No. 23,448
Claims priority, application Switzerland, Oct. 29, 1976, 13648
Int. Cl.² B41C *1/00*; B41N *3/02*
U.S. Cl. 156—656 **10 Claims**

1. Process for etching a nickel-polyester layered offset plate, which is made by electroless nickel-plating of polyester and subsequently coated on the nickel-layer by a photoresist layer, after exposure of the photoresist layer under a transparent master and development of the offset-plate, the offset-plate is etched by an aqueous etching solution containing copper (II) ions, as the only etching agent, together with Cl^- ions and preparation of an offset printing plate from said etched nickel-polyester layered plate, characterized in that:

(1) said nickel layer of said nickel-polyester layered plate is etched with said aqueous etching solution, said etching solution additionally containing:

(a) a salt which is inert as against said nickel-polyester layered plate, or 10 to 40 weight percent of an organic solvent, which is miscible or nonmiscible with water and which is inert as against said nickel-polyester layered plate, and 60 to 90 weight percent of de-ionized water; and

(b) a wetting agent or pyridine;

(ii) subsequent to the etching process, the photoresist is removed and the printing parts of the polyester of said nickel-polyester layered plate are oleophilized with an oleophilization agent which is an aliphatic acid, aromatic acid, acid chloride or acid anhydride; and

(iii) the non-etched portion of said layer of nickel of said nickel-polyester layered plate is hydrophilized with a solution of a complexing agent for nickel ions, which opposite the solvating sphere of the nickel complex has only hydrophilic groups,

said oleophilization of said polyester layer and hydrophilization of said nickel layer being executed separately in different process steps or executed concurrently in one process step using one solution containing said oleophilization agent and said complexing agent, and said aqueous etching solution not containing a side-wall protective additive.

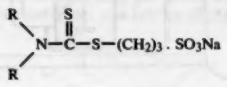
4,233,111

DISSOLUTION OF METALS UTILIZING AN AQUEOUS H_2SO_4-H_2O_2-3-SULFOPROPYLDITHIOCARBAMATE ETCHANT

Silvester P. Valayil, Youngstown, and Moenes L. Elias, Canfield, both of Ohio, assignors to Dart Industries Inc., Los Angeles, Calif.

Filed Jun. 25, 1979, Ser. No. 52,060
Int. Cl.[3] C09K *13/06*; C23F *1/00, 3/02*
U.S. Cl. 156—666 19 Claims

1. A method of metal dissolution which comprises contacting a metal with an aqueous solution containing from about 0.2 to about 4.5 gram moles per liter of sulfuric acid, from about 0.25 to about 8 gram moles per liter of hydrogen peroxide and a catalytically effective amount of an additive of 3-sulfopropyldithiocarbamate sodium salt having the general formula



wherein R is selected from the group consisting of C_1-C_4 alkyl, phenyl, C_7-C_{10} alkaryl and C_7-C_{10} aralkyl.

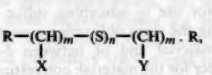
4,233,112

DISSOLUTION OF METALS UTILIZING AN AQUEOUS H_2SO_4-H_2O_2-POLYSULFIDE ETCHANT

Silvester P. Valayil, Youngstown, and Moenes L. Elias, Canfield, both of Ohio, assignors to Dart Industries Inc., Los Angeles, Calif.

Filed Jun. 25, 1979, Ser. No. 52,059
Int. Cl.[3] C09K *13/06*; C23F *1/00, 3/02*
U.S. Cl. 156—666 29 Claims

1. A method of metal dissolution which comprises contacting a metal with an aqueous solution containing from about 0.2 to about 4.5 gram moles per liter of sulfuric acid, from about 0.25 to about 8 gram moles per liter of hydrogen peroxide and a catalytically effective amount of a polysulfide compound additive having the general formula



wherein R is a hydroxyl group, a carboxyl group, a sulfonic acid group or a sulfonic acid salt group, each X independently from each other can be hydrogen, hydroxyl or C_1–C_4 alkyl, each Y independently from each other can be hydrogen, hydroxyl or C_1–C_4 alkyl, m is an integer from 1 to 18, and n is an integer from 2 to 5.

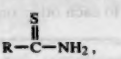
4,233,113

DISSOLUTION OF METALS UTILIZING AN AQUEOUS H_2O_2-H_2SO_4-THIOAMIDE ETCHANT

Silvester P. Valayil, Youngstown, and Moenes L. Elias, Canfield, both of Ohio, assignors to Dart Industries Inc., Los Angeles, Calif.

Filed Jun. 25, 1979, Ser. No. 51,761
Int. Cl.[3] C09K *13/06*; C23F *1/00, 3/02*
U.S. Cl. 156—666 19 Claims

1. A method of metal dissolution which comprises contacting a metal with an aqueous solution containing from about 0.2 to about 4.5 gram moles per liter of sulfuric acid, from about 0.25 to about 8 gram moles per liter of hydrogen peroxide and a catalytically effective amount of a thioamide additive having the general formula



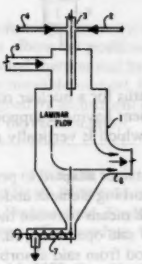
wherein R is either an aryl or a heterocyclic group and the aryl group is selected from phenyl, alkyl substituted phenyl groups containing from 7 to 10 carbon atoms and amino substituted phenyl groups and the heterocyclic group is selected from those containing at least one nitrogen atom in the ring structure.

4,233,114

SPRAY DRYER

Francesco Saverio Maria Gastaldi, Via G. Modena, 20, Milan, Italy

Continuation of Ser. No. 856,778, Dec. 2, 1977, abandoned, which is a continuation of Ser. No. 633,089, Nov. 18, 1975, abandoned. This application Apr. 24, 1979, Ser. No. 32,961
Claims priority, application Italy, Nov. 18, 1974, 29525 A/74
Int. Cl.[2] B01D *1/18*
U.S. Cl. 159—4 D 1 Claim



1. A direct drying spray dryer in which the substance to be dried is dispersed from the top of a drying chamber and a hot gas circulates from an upper portion towards a lower portion of the chamber, said dryer consisting of:

(a) a vertically extending cylindrical chamber comprising a lower conical section, a central section of a first diameter, and an upper section of a diameter less than that of the first diameter and having on its top a downwardly and vertically extending inflow nozzle means for the substance to be dried, said nozzle means being coaxial with the cylindrical chamber and terminating in an end at the bottom of the upper section within the chamber and spaced from the top thereof, said end being directed directly toward the center of the bottom of the chamber, a horizontal solution feed pipe above the top and opening directly into one side of the nozzle means, and a horizontal air feed pipe coaxial with the solution feed pipe, above the top, and opening directly into the other side of the nozzle means,;

(b) an entrance for hot gas opening into the side of the upper section of the chamber immediately adjacent and just below the top thereof in a direction directly toward the longitudinal axis of the nozzle means, said entrance being between the end of the nozzle means and the top of the chamber, and means for inducing a gas flow in the chamber from the upper section thereof;

(c) an exit for dried particles originating at and extending from the side of the chamber at an angle of about 90° to the longitudinal axis of the chamber and spaced above the bottom thereof;

(d) a bottom portion on the chamber below said exit having a length of about a chamber diameter for collecting large sized particles;

(e) means on said bottom portion for removal of said large size particles; and

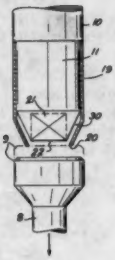
(f) said entrance, said nozzle means and said exit being fluidly connected to each other only through said chamber.

4,233,115

SAFETY APPARATUS FOR A NUCLEAR REACTOR

Roland Jacquelin, Manosque, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Apr. 6, 1978, Ser. No. 894,002
Claims priority, application France, Apr. 15, 1977, 77 11418
Int. Cl.[2] G21C *7/08*
U.S. Cl. 176—36 C **3 Claims**



2. A safety apparatus for a nuclear reactor comprising

an absorbing element having a supporting head;

an operating rod which is vertically movable and having a lower end;

an upper open container adapted to permit a sliding displacement of said absorbing element under the effect of gravity;

disconnectable link means between the supporting head and the lower end of said operating rod, adapted to disconnect said operating rod from said absorbing element at a given temperature, said link means comprising

an armature of an electromagnet fixed at the lower end of said operating rod and creating an attracting magnetic force, said armature having a first expansion coefficient and

a jacket carried by the operating head and surrounding with a clearance the end of said rod, whereby its edge is flush with the head of the absorbing element, said jacket having a second expansion coefficient said jacket having at a temperature lower than said given temperature a first length and at said given temperature a second length, said second length being such that the distance between said lower end and said head is sufficient to annul the effect of said attracting magnetic force on said head.

4,233,116

NUCLEAR REACTOR COOLANT TRANSPORT SYSTEM

James D. Mangus, Greensburg, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 585,727, Jun. 10, 1975, now Defensive Publication No. T945,008. This application Oct. 18, 1977, Ser. No. 843,183
Int. Cl.[2] G21C *15/00*
U.S. Cl. 176—65 **2 Claims**

1. An arrangement for transporting reactor coolant fluid in a nuclear reactor system comprising:

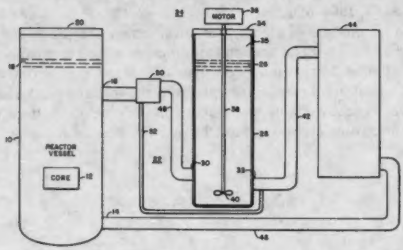
a sealed reactor vessel;

a primary variable speed pump having an inlet and outlet and being of a type having a motor disposed above a coolant reservoir and an elongated shaft connecting said motor to an impeller, said impeller receiving coolant from said inlet and discharging coolant to said outlet, said impeller also being in fluid communication with said reservoir;

a heat exchanger;

piping for directing coolant between said vessel, pump and heat exchanger in a recirculating loop including upstream piping directly connecting said pump inlet and the one of said vessel and heat exchanger upstream of said pump;

means for controlling the pressure of coolant entering said pump inlet including a bypass conduit directing a portion



of said coolant exiting said pump to said upstream piping, discharging said portion into said upstream piping through a plurality of nozzles, said nozzles disposed about the outer periphery of said upstream piping and directed such that said portion is injected into said piping from the outer periphery of said piping into said piping generally in the direction of coolant flowing in said piping.

4,233,117

MANUFACTURE OF ABRASION-RESISTANT COKE

Harald Jüntgen; Karl Knoblauch, both of Essen; Josef Degel, Hattingen; Dieter Zündorf, Essen, and Klaus Giessler, Gelsenkirchen, all of Fed. Rep. of Germany, assignors to Bergwerksverband GmbH, Essen, Fed. Rep. of Germany

Continuation of Ser. No. 806,931, Jun. 20, 1977, abandoned. This application Sep. 5, 1978, Ser. No. 939,376
Claims priority, application Fed. Rep. of Germany, Jun. 18, 1976, 2627479
Int. Cl.[3] C10B *47/20, 47/30, 53/08, 57/00*
U.S. Cl. 201—6 **7 Claims**

1. A method of making abrasion-resistant shaped coke, particularly coke for use in adsorbing sulfur oxides from flue gases, comprising the steps of forming a mixture of particulate carbonaceous material and of between 5-35% by weight thereof of a binder for the material; converting the mixture into shaped bodies; introducing the shaped bodies into a rotary furnace having an unobstructed inner cross-section free of entraining elements; and outgassing the shaped bodies in the furnace at between about 500°-900° C. to convert them into coke bodies, the step of outgassing comprising heating the shaped bodies exclusively by heating the furnace at the exterior thereof, and flushing the interior of the furnace with an inert gas to produce in the interior an atmosphere containing at most 5% by volume of oxygen wherein the bodies are heated to a temperature of between about 500°-700° C. while preventing the ignition of the expelled gases and protecting the bodies against exposure to significant mechanical stresses.

4,233,118

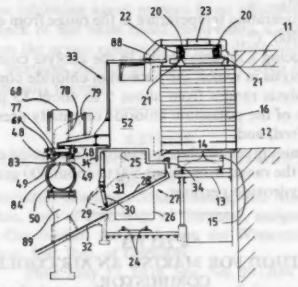
EQUIPMENT FOR COLLECTING, EXTRACTING AND PURIFYING FOUL GASES ARISING ON THE COKE SIDE OF A BATTERY OF CHAMBER COKE-OVENS WITH VERTICAL FLUE

Johann G. Riecker, Ratingen, and Horst Schröter, Viersen, both of Fed. Rep. of Germany, assignors to Hartung, Kuhn & Co. Maschinenfabrik GmbH, Dusseldorf, Fed. Rep. of Germany

Filed Jan. 12, 1979, Ser. No. 2,964
Int. Cl.[2] C10B *33/00, 39/14, 45/00*
U.S. Cl. 202—230 **8 Claims**

1. In equipment for collecting, extracting, and purifying gases arising on the coke side of a battery of coke oven cham-

bers with vertical heating flues, and wherein said equipment includes: gas gallery track means parallel to and alongside said chambers; a coke batch-conveying truck movable on said gas gallery track means alongside said chambers and having a door-lifting and cleaning device and a coke batch guide which is movable on the truck in the directions both parallel and transverse to the movement of said truck alongside said chambers; a quench train having a locomotive and a quench truck movable alongside said chambers; a hood overhanging the loading area of the quench truck and movable alongside said chambers; a stationary gas extracting and purifying device; a gas collection duct arranged parallel to said chambers and connected to said stationary gas extracting and purifying device, said gas collection duct defining a longitudinally extending opening, said opening covered by an elastic cover belt which is liftable from said gas collection duct opening; and a gas transfer device connected to said hood and movable on said gas collection duct under said belt for lifting said belt from



said gas collection duct opening thereby effecting transfer of said gases from said hood to said collection duct;

the improvement comprising:

track means on said gas collection duct;

frame means for carrying said hood and extending substantially horizontally, said frame means being supported at three spaced-apart points; and

first, second, and third wheel means, one wheel means at each of said three support points for supporting said frame, said first wheel means being mounted for movement along said gas gallery track means and said second and third wheel means being mounted for movement along said gas collection duct track means, the distance of said frame support point on said gas gallery track means from the line joining said other two frame support points on said gas collection duct track means being less than the distance between said other two frame support points on said gas collection duct track means.

4,233,119

ASCENSION PIPE AND ELBOW CLEANING APPARATUS

Leo J. Meyers, and Louis A. Grant, both of Pittsburgh, Pa., assignors to Louis A. Grant, Inc., Pittsburgh, Pa.

Filed Jan. 23, 1979, Ser. No. 5,841

Int. Cl.[2] C10B *43/06*

U.S. Cl. 202—241 **15 Claims**

1. In a cleaning apparatus carried by a car traveling along a coke oven, having a cleaning element for the cleaning of the inner surface of the lateral legs of ascension pipe elbows, the improvement comprising:

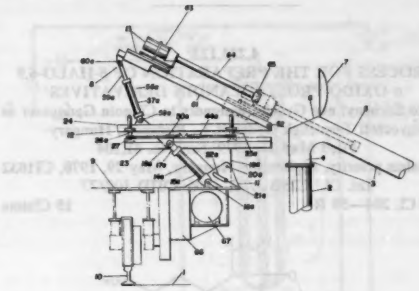
(a) a base support mounted on the car;

(b) a movable support comprising a lower plate connected to the base support and an upper plate superimposed upon and remotely connected to the lower plate;

(c) means for adjusting vertical displacement between said upper and lower plates;

(d) means for laterally and angularly moving the upper plate relative to the lower plate;

(e) said cleaning element being pivotally mounted on the movable support, and comprising a cleaning head mounted on an arm and means for moving said arm in a forward or rearward direction, whereby upon initial



alignment of the cleaning element with the lateral leg of the ascension pipe elbow by positioning the car and the base support mounted thereon and by pivoting the cleaning element on the movable support, the cleaning element may be further aligned by adjustment of the position of the upper plate of the movable support.

4,233,120

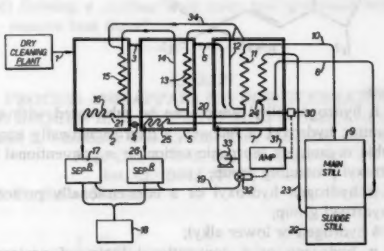
DISTILLATION METHOD FOR SOLVENT RECOVERY

David Finlay-Maxwell, Huddersfield, England, assignor to John Gladstone & Company (Engineering) Limited, Galashiels, Scotland

Filed Apr. 14, 1978, Ser. No. 896,412

Int. Cl.[3] B01D *3/42, 3/36*

U.S. Cl. 203—2 **9 Claims**



1. A solvent recovery process comprising

(a) distilling a first volume of a soiled solvent of a type herein described in order to separate solvent vapor from the soiling contaminants;

(b) passing the solvent vapor in indirect heat transfer relationship with a second volume of soiled solvent so as to effect heating of said second volume;

(c) introducing controlled amounts of water into said second volume such that said second volume comprises an azeotropic mixture of water and solvent having a boiling point lower than that of the solvent, whereby said azeotropic mixture can be heated to boiling by heat transfer from said solvent vapor;

(d) condensing the solvent vapor and the vapor arising from boiling of the said azeotropic mixture of water and solvent;

(e) separating water from such condensate as is thereby obtained so as to recover the solvent therefrom;

(f) transferring and distilling contaminant sludge from the distillation of said first volume out of said first volume; and

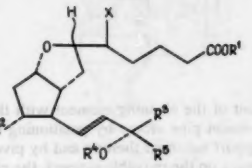
(g) passing solvent vapor arising from such distillation of said contaminant sludge in indirect heat exchange relationship with said second volume for heating the same.

4,233,121

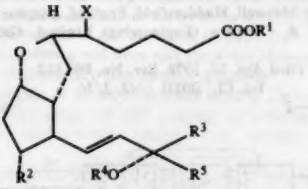
PROCESS FOR THE PREPARATION OF 5-HALO-6,9 α-OXIDO-PROSTAGLANDIN DERIVATIVES

Enikö Szebenyi nee Györi, , assignors to Chinoin Gyógyszer és Vegyeszeti Termékek Gyára R.T., Budapest, Hungary

Filed May 21, 1979, Ser. No. 41,104
Claims priority, application Hungary, May 29, 1978, CI1832
Int. Cl.³ C25B *3/02, 3/06;* **C07D** *307/77*
U.S. Cl. 204—59 R **15 Claims**



1. A process for the preparation of a 5-halo-6,9α-oxido-prostaglandin derivative of the formula II



(II)

wherein

R^1 is hydrogen alkyl which can be substituted with aryl, amino, hydroxyl or halogen, a pharmaceutically acceptable organic or inorganic cation or a conventional hydroxyl protecting group;

R^2 is hydrogen hydroxyl or a conventionally protected hydroxyl group;

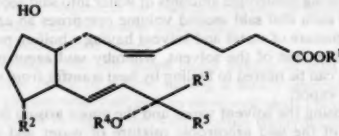
R^3 is hydrogen or lower alkyl;

R^4 is hydrogen or a conventional hydroxyl protecting group;

R^5 is straight or branched chain alkyl, which can contain one or more heteroatoms and which can be substituted with a substituted or unsubstituted aryl group, and

X is halogen,

which comprises subjecting a prostaglandin $F_{2\alpha}$ derivative of the formula I



(I)

to electrochemical oxidation in a protic medium containing halide ions.

4,233,122

ELECTROLYTIC PROCESS FOR POTASSIUM HYDROXIDE

Richard W. Lynch, Chattanooga; Garland E. Hilliard, and Ronald L. Dotson, both of Cleveland, all of Tenn., assignors to Olin Corporation, New Haven, Conn.

Filed Jun. 1, 1979, Ser. No. 44,827
Int. Cl.³ C25B *1/34*
U.S. Cl. 204—98 **7 Claims**

1. A process for the production of potassium hydroxide in an electrolytic membrane cell by employing in combination:

(a) a membrane comprised of a carboxylic acid substituted polymer prepared by reacting a fluorinated olefin with a comonomer having a functional group selected from the group consisting of carboxylic acid and a functional group which can be converted to carboxylic acid;

(b) a potassium chloride brine feed through the anolyte chamber of the cell having a concentration in the range from about 250 to about 300 grams of potassium chloride per liter;

(c) a cell operating temperature in the range from about 90 to about 100° C.;

(d) producing a depleted brine in the anolyte chamber after electrolysis in which the potassium chloride consumed by electrolysis ranges from about 5 to about 15 percent by weight of the potassium chloride originally present in the brine feed, and,

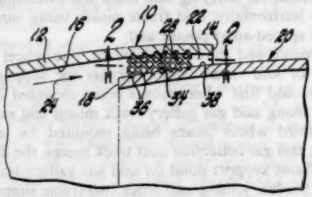
(e) maintaining a catholyte potassium hydroxide concentration in the range from about 500 to about 600 grams potassium hydroxide per liter.

4,233,123

METHOD FOR MAKING AN AIR COOLED COMBUSTOR

Ganz G. Hammer, Jr., Speedway, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 18, 1978, Ser. No. 970,630
Int. Cl.² G03C *5/00, 11/00;* **C25F** *3/02*
U.S. Cl. 204—129.65 **1 Claim**



1. A method for fabricating a gas turbine engine combustor wall having a curved surface thereon for flow of cooling air film across the inner wall surfaces of a downstream wall portion of a combustor comprising the steps of: preforming an annular metal part having a curved end surface, coating said surface with photoresist material, preparing a transparency having a crosshatch grid thereon of continuously curved intersecting lines selected to correspond to the curvature of said end surface to project as a straight line grid thereon, positioning the surface and coated photoresist material thereon on an adjustable work platform, projecting the crosshatched curved grid pattern from said transparency against the photoresist material through an angle to cause the curved grid pattern lines of the phototransparency to be exposed as a uniform straight line grid pattern on the photoresist material, developing the exposed straight line grid pattern on the photoresist material, masking all areas of the coated curved surface except the exposed straight line grid pattern thereon, and thereafter etching the uniform straight line pattern into metal of the curved end surface to produce a uniform pattern of raised lands with straight edges across the curved end surface of the annular

metal part for producing a uniform surface scrubbing action and cooling of the metal part during flow of the air film thereacross.

4,233,124

ELECTROLYTIC STRIPPING BATH AND PROCESS

Lillie C. Tomaszewski, Dearborn, Mich., assignor to Oxy Metal Industries Corporation, Warren, Mich.

Filed Oct. 29, 1979, Ser. No. 89,059
Int. Cl.[3] C25F 5/00, 3/02
U.S. Cl. 204—146 21 Claims

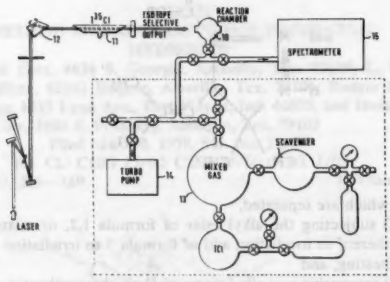
1. An electrolytic stripping bath for stripping metal deposits from a different basis metal comprising an aqueous solution having a pH of about 1 to about 14 and containing a halogen compound in an amount sufficient to activate the bath, a stripping component selected from the group consisting of (a) a bath soluble primary, secondary and/or tertiary amine having a carbon content of C_1 to C_8, (b) a bath soluble inorganic nitrate and/or organic nitro compound and mixtures of (a) and (b), and an inhibiting agent present in an effective amount to inhibit attack of the basis metal comprising a compound selected from the group consisting of glucoheptonic acid, malic acid, and mixtures thereof as well as the Group IA, IIA and ammonium salts thereof.

4,233,125

METHOD OF PHOTOCHEMICAL SEPARATION OF ISOTOPES

Fritz P. Schäfer, Göttingen-Nikolausberg, and Michael Stuke, Bovenden, both of Fed. Rep. of Germany, assignors to Max-Planck-Gesellschaft zur Förderung der Wissenschaften e.V., Gottingen, Fed. Rep. of Germany

Filed May 17, 1978, Ser. No. 907,034
Claims priority, application Fed. Rep. of Germany, May 17, 1977, 2722310
Int. Cl.[3] B01J 1/10
U.S. Cl. 204—157.1 R 10 Claims



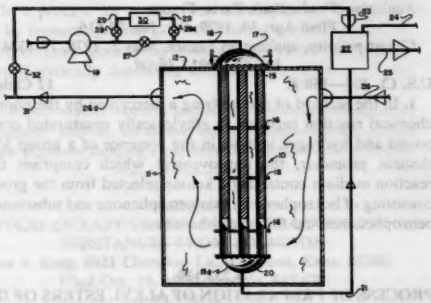
1. In a method of photochemical separation of isotopes, wherein molecules containing differing isotopes of an element are selectively excited by laser radiation of a predetermined wavelength corresponding to an absorption band in the visible or ultraviolet range, the wavelength being chosen to lift molecules containing a given isotope into an electronically excited state and to leave similar molecules containing a different isotope relativey unexcited, and the excited molecules are rendered isolatable by means of chemical reaction with a scavenger, the improvement that the selectively excited molecules are brought into reaction with a coreactant which is selected, under the prevailing conditions, firstly to react collectively in a simple additive reaction and substantially no other reaction with the excited molecules effectively to produce a single stable non-dissociating addition product and secondly to react collectively to a minimum extent with the relatively unexcited molecules.

4,233,126

OZONE PRODUCED BY CHEMONUCLEAR GENERATION

Robert I. Garcia, Baton Rouge, La., assignor to Innovative Chemicals, Inc., Baton Rouge, La.

Filed Jun. 8, 1978, Ser. No. 913,699
Int. Cl.[2] B01J 1/10
U.S. Cl. 204—157.1 H 18 Claims



1. The process for producing ozone from an oxygen containing stream comprising:

(a) providing a chemonuclear ozone generator having a plurality of generally parallel, spaced apart generator tubes received in a coolant container;

(b) placing sealed tubes containing gamma-ray emitting material within some of said generator tubes, and at least the interior surface of said remaining tubes being a material that emits photons which have an energy greater than about 5 eV when contacted by the gamma radiation;

(c) flowing said oxygen containing stream through said remaining generator tubes and thereby subjecting the oxygen containing stream material to irradiation from said surface material in combination with direct gamma irradiation to generate ozone in said oxygen material; and

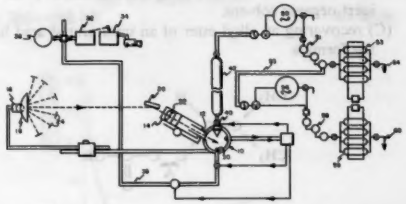
(d) flowing a cooling fluid over said generator tubes to remove heat therefrom.

4,233,127

PROCESS AND APPARATUS FOR GENERATING HYDROGEN AND OXYGEN USING SOLAR ENERGY

Daniel E. Monahan, 4925 Central Ave., Charlotte, N.C. 28205

Filed Oct. 2, 1978, Ser. No. 948,061
Int. Cl.[3] B01J 19/08, 19/26
U.S. Cl. 204—157.1 R 38 Claims



1. A process for generating hydrogen and oxygen, comprising

(a) injecting water into a reaction chamber,

(b) collecting rays of the sun and reflecting said rays into said chamber,

(c) concentrating said rays at a point spaced from and within the walls of said chamber to raise the temperature therein to the dissociation temperature of water,

(d) dissociating said water into a hydrogen component and an oxygen component, and
(e) separating the dissociated hydrogen from the oxygen.

4,233,128

PHOTOSYNTHESIS OF MERCAPTANS

Jean Ollivier, Arudy; Guy Souloumiac, and Jeannine Suberlucq, both of Pau, France, assignors to Societe Nationale Elf-Aquitaine (Production), Paris, France

Filed Apr. 30, 1979, Ser. No. 34,616
Claims priority, application France, May 5, 1978, 78 13341
Int. Cl.³ B01J *19/08*
U.S. Cl. 204—158 R **12 Claims**

1. In the method of synthesizing a mercaptan by the photochemical reaction between an ethylenically unsaturated compound and hydrogen sulfide, in the presence of a group VA element promoter, the improvement which comprises the reaction medium containing a ketone selected from the group consisting of benzophenone, thiobenzophenone and substituted benzophenones and thiobenzophenones.

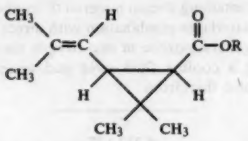
4,233,129

PROCESS OF PREPARATION OF ALKYL ESTERS OF DL CIS CHRYSANTHEMIC ACID

Michel Franck-Neumann; Christiane Dietrich-Buchecker, both of Strasbourg, and Michel Miesch, Mulhouse, all of France, assignors to Roussel Uclaf, Paris, France

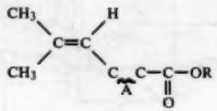
Filed Jul. 20, 1979, Ser. No. 59,291
Claims priority, application France, Jul. 24, 1978, 78 21814
Int. Cl.³ B01J *19/08*
U.S. Cl. 204—158 R **10 Claims**

1. A process for the preparation of alkyl esters of 2,2-dimethyl-3RS-(2'-methyl-1'-propenyl)-cyclopropane-1SR-carboxylic acid, or alkyl esters of dl cis chrysanthemic acid having the formula

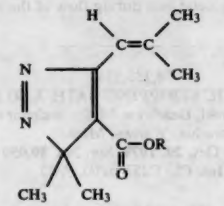


wherein R is an alkyl having from 1 to 6 carbon atoms consisting essentially of the steps of

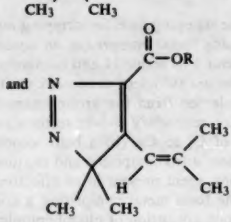
(A) reacting methyl lithium with 2-methyl-pent-2-en-4-yne in an inert organic solvent,
(B) reacting the lithiated derivative obtained with a C_1–C_6 alkyl chloroformate at a temperature below 0° C. in an inert organic solvent,
(C) recovering an alkyl ester of an unsaturated acid having the formula



wherein R has the above assigned values and $\overset{\frown}{A}$ represents a carbon to carbon bond selected from the group consisting of
an ethylenic bond and an acetylenic bond,
(D) reacting said alkyl ester of an unsaturated acid with diazo-2-propane at a temperature below 0° C. in an inert organic solvent, to obtain when $\overset{\frown}{A}$ is an acetylenic bond a mixture of compounds having the formula selected from the group consisting of

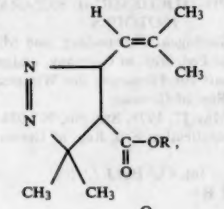


(1)

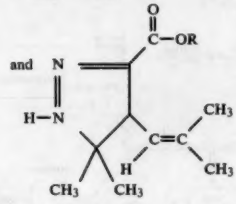


(2)

which can be separated, and when $\overset{\frown}{A}$ is an ethylenic bond, a mixture of compounds having the formula selected from the group consisting of



(3)



(4)

which are separated,
(E) subjecting the alkyl ester of formula 1,2, or mixtures thereof to irradiation and of formula 3 to irradiation and heating, and
(F) recovering said alkyl esters of dl cis chrysanthemic acid.

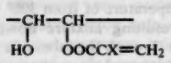
4,233,130

INK AND COATING COMPOSITIONS AND METHOD

George W. Borden, Charleston; Oliver W. Smith, South Charleston, and David J. Trecker, Charleston, all of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 103,912, Jan. 4, 1971, abandoned. This application Mar. 22, 1973, Ser. No. 343,695
Int. Cl.² C09D *3/72*
U.S. Cl. 204—159.23 **31 Claims**

1. A composition comprising:
I—an arcylated epoxidized soybean oil compound having in the molecule at least two groups of the formula



wherein X is hydrogen or methyl, said compound being the reaction product of epoxidized soybean oil reacted with acrylic acid or methacrylic acid and

II—a photosensitizer.

4,233,131

PROCESS FOR PREPARING ALKYLENE EPISULFIDES AND EPISELENIDES

Charles T. Ratcliffe, and James T. Yardley, both of Morristown, N.J., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Oct. 29, 1979, Ser. No. 89,649
Int. Cl.³ C07D *32/000*
U.S. Cl. 204—162 R **10 Claims**

1. A process for the preparation of alkylene episulfides or episelenides which comprises contacting elemental sulfur or elemental selenium, respectively, with an olefin while irradiating the sulfur/seleniumolefin materials with electromagnetic radiation in the infrared to ultraviolet range, said olefin having 2 to 6 carbon atoms and being represented by the formula:

$$R^1R^2C=CR^3R^4$$

wherein R^1, R^2, R^3 and R^4 are independently selected from the group consisting of hydrogen and alkyl groups of 1 to 4 carbon atoms.

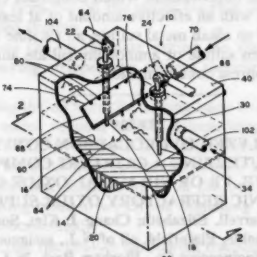
3. The process of claim 1 wherein the olefin is ethylene.

4,233,132

METHOD AND APPARATUS FOR PRODUCING HYDROGEN

Randall Carr, 4624 S. Georgia, Amarillo, Tex. 79110; L. E. Geoffroy, 6214½ Belpree, Amarillo, Tex. 79106; Rodger H. Flagg, 1415 Lynn Ave., Fort Wayne, Ind. 46805, and Donald L. Carr, 3103 S. Pittsburg, Amarillo, Tex. 79103

Filed Mar. 19, 1979, Ser. No. 21,457
Int. Cl.³ C10G *15/00*; C25B *15/00, 9/00, 1/02*
U.S. Cl. 204—169 **19 Claims**



1. A process for producing hydrogen gas comprising the steps of: passing a current through electrodes disposed within a hydrocarbon oil layer which is formed as a supernatant layer above a water layer, electrically dissociating the water layer and forming whereby a continuous outflow of hydrogen, and replenishing the water which is electrically dissociated in the aforementioned manner.

4,233,133

PASSIVATING BATH FOR SEMICONDUCTIVE BODIES

Antonio Gambardella, Cornaredo, and Marco Panigada, Pavia, both of Italy, assignors to SGS-ATES Componenti Elettronici S.p.A., Agrate Brianza, Italy

Filed Sep. 12, 1979, Ser. No. 74,773
Claims priority, application Italy, Sep. 21, 1978, 27906 A/78
Int. Cl.³ C25D *13/02, 13/10*
U.S. Cl. 204—181 N **7 Claims**

1. In a process for protectively coating a semiconductive body by immersing same in a bath having particles of a vitreous or ceramic passivating material suspended therein and electrophoretically depositing said particles on the immersed body,

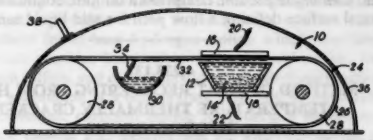
the improvement wherein said bath consists essentially of an organic solvent, an amine, and a hydrohalogenic acid in proportions yielding a pH between substantially 4 and 10.

4,233,134

METHOD AND APPARATUS FOR EXTRACTING POLAR SUBSTANCES FROM SOLUTION

Arthur S. King, 8021 Cherokee La., Leawood, Kans. 66206

Filed Oct. 19, 1977, Ser. No. 843,670
Int. Cl.³ B03C *5/00*
U.S. Cl. 204—186 **4 Claims**



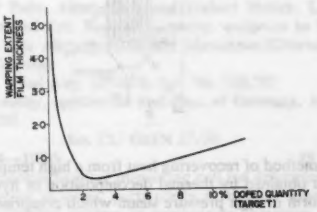
1. A method of extracting water from an aqueous solution which includes the steps of presenting the solution in spaced relationship, yet open communication and close proximity to means carrying a high voltage positive electrical charge whereby the water migrates to said charged means for collection thereon, and separating the water from said charged means.

4,233,135

METHOD OF FABRICATING PIEZOELECTRIC THIN FILM

Mitsuo Sakakura, Saitama, and Tetsuo Takaku, Tsurugashima, both of Japan, assignors to Toko, Inc., Saitama, Japan

Filed Feb. 15, 1979, Ser. No. 12,536
Claims priority, application Japan, Feb. 27, 1978, 53-2176878
Int. Cl.² C23C *15/00*
U.S. Cl. 204—192 SP **4 Claims**

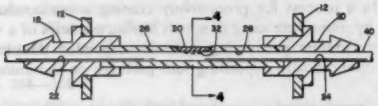


1. A method of fabricating a piezoelectric thin film of zinc oxide by means of a sputtering process, characterized by sputtering zinc and beryllium together in an oxygen atmosphere to thereby produce a thin film of zinc oxide containing 1 to 10 atom % of beryllium.

4,233,136
LIQUID MEMBRANE ELECTRODE

Frederick F. Spaziani, Lexington, and James E. Fowler, Watertown, both of Mass., assignors to Nova Biomedical Corporation, Newton, Mass.

Filed Jul. 17, 1978, Ser. No. 925,518
Int. Cl.³ G01N *27/46*
U.S. Cl. 204—195 L **13 Claims**

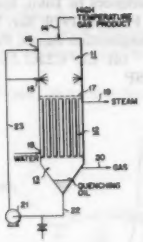


1. A flow-through electrode assembly comprising a tube or organic plastic material having a cylindrical tube wall defining therewith a cylindrical liquid sample flow path through said electrode, characterized in that said plastic material of said tube is interrupted and a membrane defines said cylindrical tube wall at said interruption of said plastic material, said membrane comprising a matrix of an organic plastic material containing a non-volatile solvent plasticizer and an ion exchange material dissolved in said solvent plasticizer, further characterized in that said membrane is chemically bonded to and integral with the remainder of said tube wall and further characterized in that the interior of said tube wall, including said membrane portion, comprises a smooth, continuous, cylindrical surface defining a flow path for said liquid sample.

4,233,137
METHOD OF HEAT RECOVERING FROM HIGH TEMPERATURE THERMALLY CRACKED HYDROCARBONS

Kiyoji Ozaki, Yokohama; Akinobu Fukuhara, Sagamihara; Takuji Hosoi, Kawasaki, and Yasuo Sagi, Iwaki, all of Japan, assignors to Chiyoda Chemical Engineering & Construction Co., Ltd., Yokohama and Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, both of, Japan

Continuation of Ser. No. 855,310, Nov. 28, 1977, Pat. No. 4,150,716, which is a continuation of Ser. No. 655,957, Feb. 6, 1976, abandoned. This application Mar. 30, 1979, Ser. No. 25,494
Claims priority, application Japan, Feb. 7, 1975, 50-15252
The portion of the term of this patent subsequent to Apr. 24, 1996, has been disclaimed.
Int. Cl.² C10G *9/16*; C10J *3/86*
U.S. Cl. 208—48 Q **11 Claims**



1. A method of recovering heat from a high temperature gas product obtained by thermal decomposition of hydrocarbons in the form of high pressure steam which comprises

(a) precooling, in a vessel comprising a precooling zone, a heat exchange zone and a separating zone, the high temperature gas product in the precooling zone by mixing said gas product with a sprayed low temperature hydrocarbon oil of a by-product obtained from said thermal decomposition of hydrocarbons, which contains from 30 to 80 percent by weight of a pitch based on the weight of said sprayed low temperature hydrocarbon oil, as a quench to a temperature of from 300° C. to 400° C.;

(b) passing the resulting mixture downwardly from the precooling zone through the tubes of a substantially vertical shell-and-tube type heat exchange means, at a linear gas velocity of 15 to 50 meters per second in said tubes to form a thin liquid film layer of the sprayed oil on the inside walls thereof, and transferring the heat contained in said resulting mixture into a high pressure water flowing through the shell side of the heat exchange means and recovering therefrom a high pressure steam of from 40 to 100 kg/cm^2;

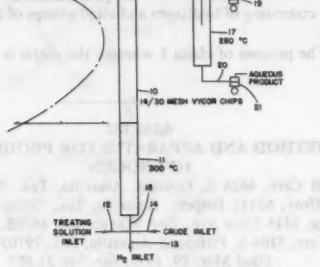
(c) separating the said hydrocarbon oil in the separating zone from said resulting mixture passed through the tubes of said heat exchange means downwardly to the separating zone; and

(d) recirculating the separated hydrocarbon oil as a quench to the precooling zone.

4,233,138
PROCESS FOR THE VISBREAKING OF HIGH-METALS CRUDES AND RESIDS

Louis D. Rollmann, Princeton, N.J., and Dennis E. Walsh, Richboro, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jan. 22, 1979, Ser. No. 5,428
Int. Cl.³ C10G *9/00*
U.S. Cl. 208—106 **7 Claims**



1. In a process for visbreaking crude and resid feeds containing a quantity of metal values promoting the significant formation of coke, the improvement which comprises carrying out the visbreaking with an effective amount of at least one inorganic sulfide of an alkali metal sulfide, an alkaline earth metal sulfide, hydrogen sulfide or ammonium sulfide admixed with said feed to suppress coke formation.

4,233,139
ACID CATALYZED HYDROCARBON CONVERSION PROCESSES UTILIZING A CATALYST COMPRISING A GROUP IVB, VB OR VIB METAL OXIDE ON AN INORGANIC REFRACTORY OXIDE SUPPORT

Lawrence L. Murrell, Elizabeth; Chang J. Kim, Somerset, and Dane C. Grenoble, Plainfield, all of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Jul. 25, 1978, Ser. No. 927,828
Int. Cl.³ C10G *11/04, 47/12, 49/04, 49/18*
U.S. Cl. 208—112 **16 Claims**

1. In a hydrocarbon conversion process wherein hydrocarbon fractions are cracked over acid catalysts at elevated temperatures, the improvement comprising using as the catalyst a material comprising a catalytic metal oxide selected from the group consisting of the oxides of tungsten, niobium, and mix-

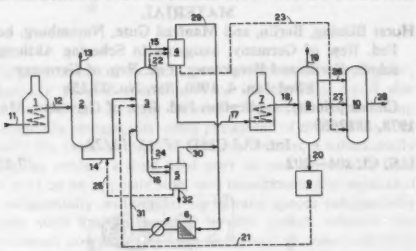
tures thereof and tungsten or niobium oxides in combination with one or more additional metal oxides selected from the group consisting of tantalum oxide, hafnium oxide, chromium oxide, titanium oxide and zirconium oxide supported on an inorganic refractory metal oxide base selected from the group consisting of alumina, zirconia, boria, thoria, magnesia, zirconium-titanate, titania, chromia, kieselguhr and mixtures thereof, said catalyst being steamed prior to use.

4,233,140

PROCESS FOR REGENERATING EXHAUSTED OILS

Sergio Antonelli, Peschiera Borromeo, and Michele Borza, Cremona, both of Italy, assignors to Snamprogetti, S.p.A., Milan, Italy

Filed Dec. 18, 1978, Ser. No. 970,185
Claims priority, application Italy, Jan. 12, 1978, 19203 A/78
Int. Cl.[2] C10M *11/00*
U.S. Cl. 208—180 **9 Claims**



1. A process for regenerating spent oils, characterized by comprising the steps of:

(a) Heating the oil in a first oven,

(b) Sending the heated oil to a pre-distillation column and separating at the column head the water and the light hydrocarbons,

(c) Recovering from the bottom of the pre-distillation column the oil which is sent to a solvent-extraction section to remove from the oil the major fraction of the impurities contained therein,

(d) Heating the oil raffinate exiting the extraction section after having stripped the solvent therefrom in a second oven,

(e) Feeding the oil from the heating stage to a stage of distillation under vacuum with a bottom temperature higher than 300° C., to separate from the column side the lubricating bases having the lower viscosity and deprived of impurities and discharging from the bottom the heavier lubricating bases in which the remaining impurities have been concentrated,

(f) Subjecting the heavier lubricating fraction to a heat treatment at a temperature from 300° C. to 450° C. under adiabatic conditions for a time varying from 1 to 120 minutes,

(g) Subjecting the heavier lubricating fraction, after the heat treatment, to a second extraction with solvent, and

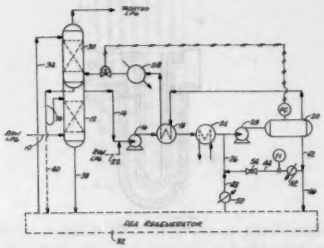
(h) Sending the heavy lubricating base raffinate and the other bases having a lower viscosity, separately, to a hydrofinishing stage.

4,233,141

PROCESS FOR REMOVAL OF CARBONYL SULFIDE IN LIQUIFIED HYDROCARBON GASES WITH ABSORPTION OF ACID GASES

David K. Beavon, Pasadena, and Mark Mackles, Tarzana, both of Calif., assignors to The Ralph M. Parsons Company, Pasadena, Calif.

Filed Apr. 27, 1979, Ser. No. 33,875
Int. Cl.[3] C07C *7/11*; C01B *31/26*, *17/16*; C07C *9/10*
U.S. Cl. 208—236 **18 Claims**



1. A process for purifying liquified hydrocarbon gases containing as an impurity carbonyl sulfide which comprises:

(a) intimately mixing the liquified hydrocarbon gas containing carbonyl sulfide with a liquid aqueous solution of an absorbent for at least hydrogen sulfide which absorbent does not combine irreversibly with carbonyl sulfide, hydrogen sulfide, and carbon dioxide in a hydrolysis reaction zone maintained at a temperature sufficient to hydrolyze the contained carbonyl sulfide to hydrogen sulfide and carbon dioxide and hydrolyzing the carbonyl sulfide to form a two phase mixture of liquified hydrocarbon gas containing at least a portion of the hydrogen sulfide and carbon dioxide formed by hydrolysis and the liquid aqueous solution of the absorbent containing at least hydrogen sulfide;

(b) separating the liquified hydrocarbon gas containing hydrogen sulfide and carbon dioxide from the liquid aqueous solution of the absorbent containing at least hydrogen sulfide;

(c) contacting the liquified hydrocarbon gas containing the hydrogen sulfide and carbon dioxide with a hydrogen sulfide lean aqueous absorbent for at least hydrogen sulfide which does not combine irreversibly with carbonyl sulfide, hydrogen sulfide, and carbon dioxide at a temperature lower than the temperature of the hydrolysis reaction zone to absorb hydrogen sulfide from the liquified hydrocarbon gas.

4,233,142

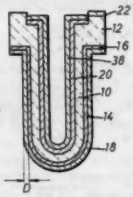
ELECTROCHEMICAL MEASURING CELL

Franz-Josef Rohr, Abtsteinach, and Hubert Holick, Lampertheim, both of Fed. Rep. of Germany, assignors to Brown, Boveri & Cie Aktiengesellschaft, Mannheim-Käfertal, Fed. Rep. of Germany

Filed Aug. 22, 1978, Ser. No. 935,787
Claims priority, application Fed. Rep. of Germany, Aug. 27, 1977, 2738755
Int. Cl.[3] G01N *27/58*
U.S. Cl. 204—195 S **15 Claims**

1. In an electrochemical measuring cell for determining the oxygen content in gases, particularly in exhaust gases from internal-combustion engines or combustion chambers, having an ion-conducting solid electrolyte for passage of oxygen ions through the solid electrolyte with a measuring electrode disposed as a first layer on a surface of the ion-conducting solid electrolyte and a reference electrode disposed as a second layer on a surface of the ion-conducting solid electrolyte opposite the first layer, the combination therewith of a catalytically

active porous third layer coating the first layer measuring electrode, said third layer containing a material with a medium partial oxygen pressure to obtain a change in voltage from the electrochemical measuring cell with change in air number with a characteristic which has a medium slope in the range of the air number of about 1 wherein a medium slope means an approximately linear voltage change of the measuring cell of about 500 mV corresponds to a change of the air number of between 0.1 and 0.5 and wherein the third layer contains a mixture of an inert ceramic material with a material of the formula



$Me_x^I\ Me_y^{II}\ Me^{III}\ O_3$

where Me^I is a member selected from the group consisting of lanthanum, gadolinium and praseodymium; Me^{II} is a member selected from the group consisting of strontium, calcium and barium; and Me^{III} is a member selected from the group consisting of manganese, nickel, cobalt and chromium, and x has a value of 0.74 to 0.92, and y has a value of 0.08 to 0.26.

4,233,143

MEASURED VALUE RECEIVER FOR THE POLAROGRAPHIC MEASUREMENT OF GASES IN LIQUIDS

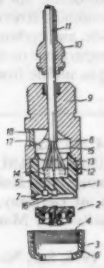
Ole F. Knudsen, Sonderborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Filed Oct. 25, 1978, Ser. No. 954,328

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1977, 2748191

Int. Cl.³ G01N *27/30, 27/46*

U.S. Cl. 204—195 P **1 Claim**



1. A measured value receiver for the polarograph measurement of gases in liquids, comprising a mounting member having an end face with associated cathode and anode contacts, carrier means having a base with a face in abutting engagement with said end face, means for connecting said carrier means to said mounting member, said carrier means having an annularly shaped wall and a central post member extending from said base and forming an annularly shaped recess, said wall having an end face and said post member having a supporting face disposed a greater distance from said base than said end face, said post supporting face having a cathode associated therewith, said carrier means having an anode projecting into said chamber, said cathode and anode having corresponding contacts in said base face cooperable with said like contacts in said mounting member end face, a diaphragm permitting diffusion of gas attached to said wall end face to enclose said recess to form a completely fluid tight chamber, and a quantity of electrolyte filling said chamber with said quantity being selected so that said diaphragm is in contact with said supporting face and has an inwardly and concavely formed contour to allow for temperature responsive expansion and contraction of said electrolyte.

4,233,144

ELECTRODE FOR VOLTAMMETRIC IMMUNOASSAY

Salvatore J. Pace, Yorktown Heights, and Anand Kumar, Monroe, both of N.Y., assignors to Technicon Instruments Corporation, Tarrytown, N.Y.

Filed Apr. 16, 1979, Ser. No. 30,206

Int. Cl.² G01N *27/30, 33/16*

U.S. Cl. 204—195 B **8 Claims**

1. A voltammetric monitoring electrode for measuring electrochemical changes resulting from an immunoreaction between complementing immunoreactants, said voltammetric monitoring electrode comprising an electroactively-labelled immunoreactant attached to a surface thereof.

4,233,145

DEVICE FOR THE PROCESSING OF POURABLE BULK MATERIAL

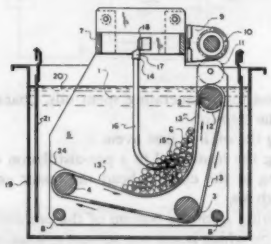
Horst Blüsing, Berlin, and Manfred Gute, Nuremburg, both of Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Filed Jun. 4, 1980, Ser. No. 22,156

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1978, 2812559

Int. Cl.³ C25D *17/16, 17/22*

U.S. Cl. 204—202 **7 Claims**



1. A device for chemically and electro-chemical processing, especially electroplating, of pourable bulk material, comprising a tank adapted to contain a chemical solution; means removably supported on said tank spaced from the inner surface thereof for forming a trough to receive the material to be processed, said trough forming means comprising a pair of transversely spaced side plate means, a pair of reversing rollers turnably mounted in said side plate means with one of said reversing rollers at a lower elevation and the other at a higher elevation, an endless perforated belt extending about said reversing rollers and having an upper and a lower run, said side plate means being constructed to guide said upper run of said belt along a path having a first branch descending from said reversing roller mounted at said lower elevation of said side plate means at a small angle to the horizontal to a deepest point of said trough and a second branch rising from the deepest point in nearly vertical direction to the reversing roller at the higher elevation, and a tension roller engaging the lower run of said belt; means connected to said side plate means for removably supporting said trough forming means on said tank and for

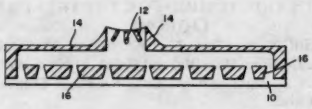
connecting lifting means to said trough forming means so that the latter may be lifted out of said tank; and reversible drive means operatively connected to one of said rollers to drive said belt in one or the other direction so that during processing the material said upper run may be driven in a direction moving from the lower reversing roller towards the upper reversing roller, whereby said second nearly vertical branch of said upper belt will retain the material in the trough while when the trough forming means is lifted out of said tank, said drive means may be reversed so that the material will be discharged from the trough over said first branch of said upper run and the lower reversing roller.

4,233,146

CELL FLOW DISTRIBUTORS

Noel Y. Rothmayer, Madison; Preston Keusch, Paramus, and Dietrich E. Kattermann, Morristown, all of N.J., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Mar. 9, 1979, Ser. No. 19,056
Int. Cl.³ C25B *13/02, 9/00*; H01M *2/14*
U.S. Cl. 204—255 **13 Claims**



1. An improved cell including two substantially rectangular, substantially parallel membranes of substantially equal size separated by a gasket in the form of a four-sided frame having a substantially rectangular outer perimeter of dimensions substantially the same as those of said membranes, a substantially rectangular cutout, a fluid inlet port on one side and a fluid outlet port on an opposite side, said membranes also separated by a substantially rectangular membrane spacer substantially coplanar with and surrounded by the gasket, wherein the improvement comprises an inlet distributor in communication with and adjoining the inlet port for directing the fluid through the cell, the distributor comprising:

(a) a covering comprising two substantially parallel closely spaced, flexible sheets, the ends of the sheets opposite the inlet port grasping a first edge of the spacer; and

(b) a plurality of inserts disposed between and joined to the sheets and so dimensioned and positioned that the flow of fluid through the cell is substantially uniform.

4,233,147

MEMBRANE CELL WITH AN ELECTRODE FOR THE PRODUCTION OF A GAS

Umberto Giacopelli; Bruno Grassi, both of Rosignano-Solvay, Italy, and Rene Crabbe, Brussels, Belgium, assignors to Solvay & Cie., Brussels, Belgium

Continuation of Ser. No. 930,239, Aug. 2, 1978, abandoned, which is a continuation of Ser. No. 772,563, Feb. 28, 1977, abandoned. This application Jul. 17, 1979, Ser. No. 58,367
Claims priority, application France, Mar. 8, 1976, 76 06764
Int. Cl.³ C25B *9/00*
U.S. Cl. 204—266 **7 Claims**

1. In an electrolytic cell of the membrane type having at least two vertical electrodes comprising an anode and a cathode, a membrane between the anode and the cathode, at least one of both said anode and said cathode comprising a vertical conductive plate, said plate having a horizontal zone for connecting an electrical lead thereto, said plate having vertically extending narrow slots distributed thereon, the slots comprising vertical elongated slots, said plate having vertically disposed elongated vanes extending obliquely from an active face of said plate and disposed adjacent ones of the vertical elongated slots, each of said vanes being disposed opposite a corresponding slot substantially in parallel vertical rows, and said vertical elongated slots and said vertical vanes being disposed effectively to transfer gas from the active face of the plate to a rear side of the

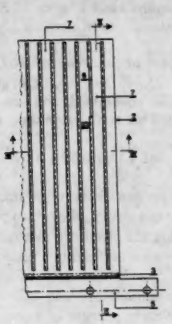


plate and thus avoid bubbles of gas in an anode-cathode gap between the anode and the cathode and effective to reduce composition of electrical energy during electrolysis.

4,233,148

ELECTRODE COMPOSITION

David E. Ramsey, Johnson City, and Lloyd I. Grindstaff, Elizabethton, both of Tenn., assignors to Great Lakes Carbon Corporation, New York, N.Y.

Filed Oct. 1, 1979, Ser. No. 80,430
Int. Cl.³ C25B *11/04*
U.S. Cl. 204—291 **11 Claims**

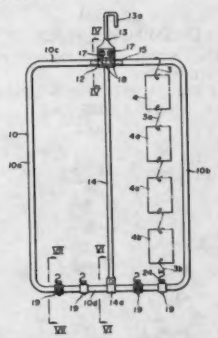
1. An electrode suitable for the production of aluminum in a Hall cell comprising a homogeneous sintered ceramic body having the composition of 67 to 78% SnO_2, 19 to 30% GeO_2 and from 1 to 3% of an electroconductive oxide selected from the group consisting of Sb_2O_3, Bi_2O_3, and MnO_2.

4,233,149

ANODE SUPPORT MEMBER

Kazuo Toda; Tadashi Hosoda, both of Urawa, and Yutaka Matsuo, Tokyo, all of Japan, assignors to Mitsubishi Kinzoku Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 14, 1979, Ser. No. 12,125
Int. Cl.³ C25B *11/10*; C25D *17/04, 17/06, 17/12*
U.S. Cl. 204—297 W **19 Claims**



1. An anode member for anodic oxidation treatment, wherein said anode member is constructed of at least one of: constructive zirconium alloy material or scrap of zirconium alloy tube such as rejected product or short dimensioned products.

4,233,150

PROCESS FOR BENEFICIATION OF NON-SULFIDE IRON-FREE ORES

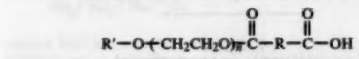
Samuel S. Wang, Cheshire, and Eugene L. Smith, Jr., Milford, both of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 819,302, Jul. 27, 1977, abandoned, Ser. No. 723,840, Sep. 16, 1976, abandoned, Ser. No. 686,629, May 14, 1976, abandoned, and Ser. No. 650,094, Jan. 19, 1976, abandoned. This application Jan. 19, 1979, Ser. No. 4,643

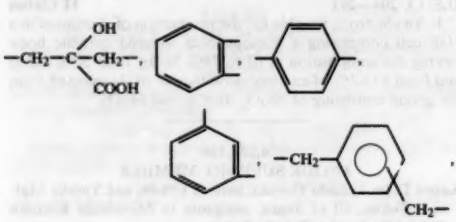
Int. Cl.³ B03D *1/02*

U.S. Cl. 209—166 **8 Claims**

1. A process for the beneficiation of non-sulfide, iron-free ores which comprises classifying the ore to provide particles of flotation size, slurrying the sized ore in aqueous medium, conditioning the slurry with an effective amount of a combination of about 99 to about 5 weight percent of a fatty acid derived from a vegetable or animal oil and, correspondingly, from about 1 to about 95 weight percent of a partial ester of a polycarboxylic acid having at least one free carboxylic acid group, and floating the desired ore by froth flotation, said partial ester having the structure:



wherein R′ is a primary or secondary alkyl group of about 8 to 18 carbon atoms, n is an integer of about 1-10 and R is a bivalent grouping selected from $-CH_2-_m$ wherein m is an integer of 1 to 6, —CH=CH—, —CHOH—CHOH—,



ortho, meta, and para, $-C_6H_8-$, and $-C_6H_{10}$.

4,233,151

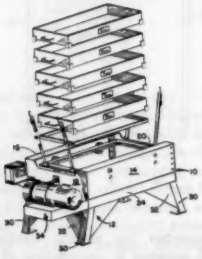
SHAKER MECHANISM FOR A STACK OF SIEVE TRAYS

John A. Gundlach, Everett, Wash., assignor to Everett Metal Products, Everett, Wash.

Filed Aug. 14, 1978, Ser. No. 933,633

Int. Cl.³ B07B *1/46*

U.S. Cl. 209—319 **13 Claims**



10. Mechanism for shaking a stack of sieve trays, comprising:

a frame including a pair of spaced apart side members and a supporting base;

a carrier for a stack of sieve trays positioned between said spaced apart side members;

means mounting said carrier onto inner portion of said frame side members, for horizontal rectilinear translation, said means comprising support rails and anti-friction rollers in rolling contact with said support rails, said anti-friction rollers comprising a lower set of horizontal spaced apart rollers and an upper set of horizontally spaced apart rollers, said support rail being positioned vertically between said upper and lower sets of rollers;

said rollers being metal cam rollers and each said support rail including a detachable lower bearing strip in contact with the lower rollers and a detachable upper bearing strip in contact with the upper rollers, said bearing strips being constructed from a structural plastic material;

power drive means for translating the carrier and any sieve trays mounted thereon back-and-forth; and

means for securing a stack of sieve trays onto said carrier.

4,233,152

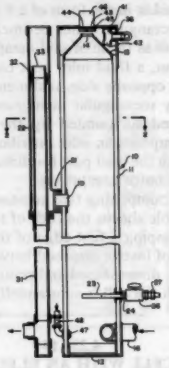
APPARATUS AND METHOD FOR THE TREATMENT OF LIQUORS

Robert C. Hill, Santa Clara; Niel E. Nielson, Mountain View; Ronald L. Kreiling, Danville, and Ralph A. Nice, Burlingame, all of Calif., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Mar. 19, 1979, Ser. No. 21,430

Int. Cl.² C02B *3/08*

U.S. Cl. 210—703 **18 Claims**



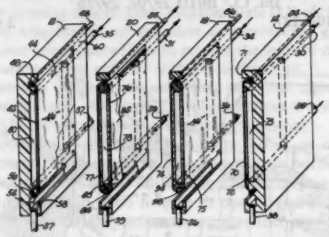
1. A contactor for treating liquors with gas containing ozone for removing contaminating solids and the destruction of bacteria and viruses, the gas being supplied from a source of the same, the contactor comprising an elongated vertical tank, inflow piping connected to the lower portion of the tank, outflow piping connected to an intermediate portion of the tank and spaced upwardly from the inflow piping, means connected to said source for introducing said gas containing ozone into the tank at a level between the inflow and outflow connections, means for maintaining a quiescent zone of liquor and a desired liquor level in the upper portion of the tank, means at the upper end of the tank for receiving and mechanically shearing and impacting foam discharging from the tank to collapse the foam bubbles, and means for collecting and removing the liquor of the collapsed bubbles and for the discharge of gas evolved from the same, said means for maintaining a desired level of liquor in the tank consisting of a vertical standpipe having its lower end connected to receive liquor from the outflow piping.

4,233,153

CONTINUOUS METHOD AND APPARATUS FOR SEPARATING SOLVENT FROM SOLUTE

Harold T. Hammel, Del Mar, and James E. Maggert, San Diego, both of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Continuation-in-part of Ser. No. 851,918, Nov. 21, 1977, Pat. No. 4,153,546. This application Mar. 27, 1978, Ser. No. 890,442
Int. Cl.[2] B01D *17/00*
U.S. Cl. 203—10 5 Claims



1. An apparatus for the continuous separation of a volatile solvent from a solution of said solvent and a relatively non-volatile solute, comprising:

means for defining a cool, extended surface;

means for defining a warm, extended surface opposite said cool surface and spaced therefrom a predetermined distance;

means for flowing solution over said warm surface comprising a sheet of thin fibrous material, means for disposing said sheet in direct contact with said warm surface, and means for releasing said solution above said warm surface for conduction by said sheet in a substantially continuous thin film over said warm surface confined thereon to define a continuous vapor gap between said warm and cool surfaces whereby to form a condensate on said cool surface; and

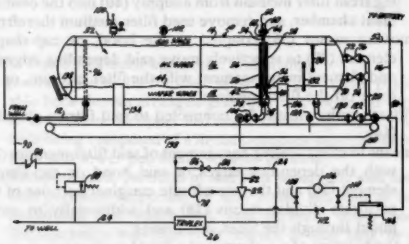
means for recovering condensate formed on said cool surface separately from said solution, said predetermined distance being at least greater than the combined thickness of said flowing solution and said condensate.

4,233,154

METHOD FOR TREATING PETROLEUM WELL PUMPING POWER FLUID

Charles L. Presley, Houston, Tex., assignor to Kobe, Inc., Huntington Park, Calif.

Filed Dec. 29, 1978, Ser. No. 974,528
Int. Cl.[2] B01D *21/10*
U.S. Cl. 210—800 6 Claims



1. An improved method of providing a power liquid to downhole machinery of a petroleum well by a system including a separation vessel for separating production liquid from the well into liquid phases, a pump for increasing the hydrodynamic head of the power liquid taken from at least one of the liquid phases separated from the production fluid in the separation vessel, and means for re-introducing power liquid of such increased hydrodynamic head back into the well, the improvement comprising:

(a) providing partition means in the separation vessel to separate the tank into at least two compartments, a first of these compartments liquid dimensioned to accomodate surges of production liquid, and a second of these compartments being for the phase separation of production liquid fed from the first compartment;

(b) providing flow line means from the second compartment for the discharge of liquid therefrom;

(c) providing flow line means from the first compartment for providing the power liquid to a pump;

(d) providing liquid phase level control means for the first compartment comprising a phase level control line in the separation vessel between the first and second compartments, the phase level control line having an entrance in the first compartment at a level corresponding to the water phase and an outlet in the second compartment, the entrance being lower in elevation than the outlet, the flow line means from the second compartment having an entrance lower in elevation than the outlet of the phase level control line, whereby a minimum liquid level is maintained in the first compartment to act as a reservoir for power liquid and an interface between the oil phase and water phase is maintained within a desired elevational band; and

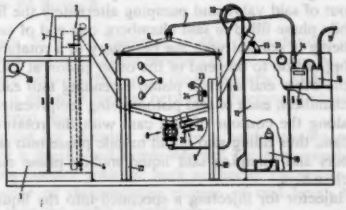
(e) feeding production liquid from said first compartment through said phase level control line to said second compartment.

4,233,155

APPARATUSES FOR THE ANAEROBIC DIGESTION OF NATURAL ORGANIC WASTE

Dennis L. Hawkes; Rex Horton, both of Mid-Glamorgan, and David A. Stafford, Cardiff, all of Wales, assignors to Hamworthy Engineering Limited, Fleets Corner, England

Filed Nov. 22, 1978, Ser. No. 963,095
Int. Cl.[3] B01D *55/14*
U.S. Cl. 210—92 10 Claims



1. Apparatus for the anaerobic digestion of natural organic waste comprising a closed container in which the organic waste can be retained while the anaerobic microrganism present in the waste digests the same, a feed tube which extends downward into said container on one side thereof and through which said natural organic waste is introduced into said container, an inclined outlet tube which extends upward from the container on the opposit side thereof to a point higher than the lower end of said inlet tube such that the liquid level in the container remains above the ends of the inlet and outlet tubes which communicate with the container and hence the space in the container above the liquid level is sealed from the atmosphere by said liquid, the inclination of said outlet tube being such that as waste is introduced into the container through the feed tube and the liquid overflows through the outlet tube,

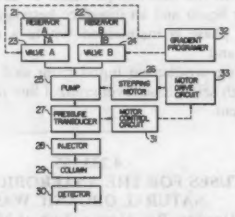
solids which have not settled to the bottom of the container settle onto the inclined wall of the outlet tube and remain in the container, a gas outlet in the top of the closed container through which the gases produced by digestion of the organic waste are collected; a diffuser located in the bottom of said container, a gas pump for pumping the collected gases through said diffuser, means establishing communication between said gas outlet and sid gas pump, and means establishing communication between said gas pump and diffuser beneath the container, said diffuser comprising a flexible membrane perforated with holes which are sufficiently fine to open only when pressurized by gas from said gas pump, whereby efficient mixing of the contents and intimate contact between gas and bacteria therein is effected, improving the efficiency of anaerobic digestion of waste in the container.

4,233,156

LIQUID CHROMATOGRAPHY APPARATUS

Katsuo Tsukada, Nakamachi, and Sadabumi Ohnuma, Hitachi, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Mar. 7, 1979, Ser. No. 18,334
Claims priority, application Japan, Mar. 10, 1978, 53/26554
Int. Cl.[3] B01D *15/08*
U.S. Cl. 210—101 **12 Claims**



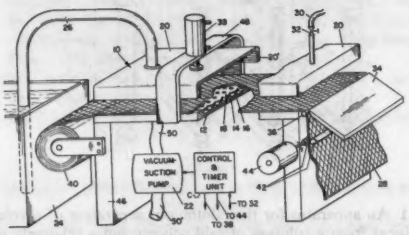
1. A liquid chromatography apparatus comprising:
at least one reservoir for storing at least one liquid mobile phase;
at least one valve for controlling the liquid mobile phase flowing out of said at least one reservoir;
a reciprocating dual-piston pump including two pistons for filling two chambers with the liquid mobile phase flowing out of said valve and pumping alternately the liquid mobile phase filled in said chambers, one end of each piston being in contact with the periphery of a rotatable cam in opposition to one end of the other piston at 180 degrees, the other end of each piston extending into each of said chambers, each of said pistons being reciprocated linearly along the contour of said cam with the rotation of said cam, thus filling said liquid mobile phase into said chambers and pumping said liquid mobile phase out of said chambers;
an injector for injecting a specimen into the liquid mobile phase passed through said pump;
a column for separating the specimen injected by said injector, into components;
a detector for detecting the components of said specimen separated by said column;
a programmer for controlling the operating time of said at least one valve;
motor means coupled to said cam of said pump for driving said pump through successive cycles of reciprocation;
said cam having a shape such that when the time derivative of displacement of one piston is positive over an angle range, the time derivative of displacement of the other piston is a negative fixed value over substantially the entire angle range that said one piston is positive, and when the time derivative of displacement of said one piston is negative over an angle range, the time derivative of displacement of said other piston is a positive fixed value over substantially the entire angle range that said one piston is negative.

4,233,157

TRAVELLING SHEET, FLAT-BED FILTER APPARATUS AND SYSTEM

Peter A. Miller, Mozartstrasse 16, D 6370 Oberursel, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 466,171, Apr. 10, 1975, abandoned. This application Nov. 23, 1977, Ser. No. 854,192
Int. Cl.[3] B01D *29/02, 29/36*
U.S. Cl. 210—137 **3 Claims**



1. Travelling sheet, flat-bed filter apparatus to filter contaminated liquids supplied from a contaminant tank (24) and deliver filtered fluid to a fluid outlet (50) comprising
a housing (10; 12, 20) defining a chamber therein and having a bottom wall (12);
a perforate divider means (18) located essentially horizontally and subdividing the chamber into an upper contaminant chamber (20') and a lower filtrate chamber (14) therebelow;
a web of filter medium (28), extending from outside of the housing into the contaminant chamber (20') and therebeyond outside of the housing,
the perforate divider means having unperforate, marginal portions;
the housing defining said contaminant chamber including a shallow hood, or cap-shaped element (20) extending over said perforate divider means (28) and having depending edges, said depending edges being positioned to directly engage the web of the filter medium (28) in the region of the marginal unperforate portions of said perforate divider means;
contaminated liquid inlet means formed in said hood, or cap-shaped element (20) and a connection conduit (26) extending between said contaminant tank (24) and the contaminated liquid inlet means to supply liquid to said upper contaminant chamber means (20');
means (44) engageable with said web of filter medium moving fresh filter medium from a supply (40) into the contaminant chamber, and remove used filter medium therefrom;
moving means (38) coupled to the hood, or cap-shaped element (20) to selectively move said depending edges of said element in engagement with the filter medium, or lift them off the filter medium,
filtrate outlet means (50) connected to said filtrate chamber (14);
means to effect sealing engagement of said filter medium (28) with the depending edges of said hood or cap-shaped element (20) and the unperforate marginal portions of the perforate divider means (18) and additionally to move liquid through the filter, comprising
a combination of a vacuum and a liquid suction pump means (22) connected to the filtrate chamber (14) and forming the sole source of pressure differential to move the contaminant liquid from the contaminant tank (24) through said conduit means and the inlet means into the contaminant chamber (20'), for filtration by the filter medium (28)

and pumping to the fluid outlet (50) to provide for direct supply of liquid from said contaminant tank (24) to the contaminant chamber (20') and exposure of said combination pump means (22) to only fluid which is uncontaminated and simultaneously provide for a vacuum within the contaminant chamber (20') which holds the edges of the movable hood, or cap-shaped element (20) in sealing contact with said filter medium and against the unperforate portions of said perforate divider means (18);

support means (16) located in the lower filtrate chamber (14) and supporting said perforate divider means (18) within the housing spaced from a bottom plate (12) of the housing and wherein, to use the filter as a protected gas or protected atmosphere filter to protect the interior of the filter chamber from contact with the ambient air,

the portion of the housing defining said filter chamber (814) and forming the bottom wall comprises a bottom plate (812) having marginal unperforate portions;

the depending edges of the shallow hood, or cap-shaped element (820) engaging said unperforate portions of the bottom plate, with said filter medium interposed;

duct means (865, 866) formed in one of said portions and terminating at the surface facing the other of said portions; and

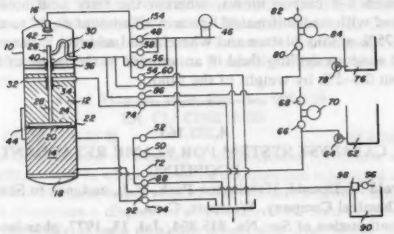
a source (970) of protective gas, said duct means being connected to the source of protective gas to supply protective gas to said contaminant chamber (820') upon vacuum-and-liquid suction operation of said pump means (22), leakage of said gas at the junction of said portions, with said filter medium (828) interposed, introducing said protective gas into said contaminant chamber and preventing ingress of ambient air.

4,233,158

LIQUID TREATMENT TANK HAVING A VOLUME COMPENSATING STRUCTURE FOR USE WITH VOLUME VARIABLE LIQUID TREATMENT MATERIAL

William A. Wachsmuth, 1531 Pinetree Crescent, Mississauga, Ontario, Canada (L5G 2S9)

Filed Nov. 1, 1978, Ser. No. 956,670
Int. Cl.³ B01D *23/10*
U.S. Cl. 210—283 **33 Claims**



3. A liquid treatment apparatus, comprising:

a generally vertically disposed tank having two fluid permeable beds therein arranged generally one above the other so as to define an upper bed and a lower bed, each of said beds being composed of a liquid treatment material with at least said lower bed being volume variable;

a fluid permeable partition in said tank separating said beds, said partition supported by said lower bed and in turn supporting said upper bed, said partition being freely longitudinally movable with respect to said tank in response to expansion and contraction of said lower bed and including partition conduit means for collecting and distributing fluids between said beds, said partition conduit means being an integral part of said partition and being freely longitudinally movable therewith;

a main partition fluid conduit passing between the inside and the outside of said tank to which said partition conduit means is connected; and,

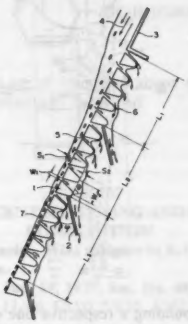
said partition including sealing means about its periphery which engages the inside wall of said tank to prevent the passage of said liquid treatment material between said partition and said inside wall while permitting the relative movement of said partition with respect to said tank.

4,233,159

SOLID-LIQUID SEPARATION ELEMENT AND APPARATUS

Teruo Senda, and Mitsunobu Otani, both of Otsu, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Nov. 21, 1978, Ser. No. 962,641
Claims priority, application Japan, Nov. 28, 1977, 52-141688
Int. Cl.³ B01D *23/24*
U.S. Cl. 210—413 **8 Claims**



1. A solid-liquid separation apparatus for use in the treatment of waste water comprising:

(a) a solid-liquid separation element composed of a screen having a plurality of openings therein and guide members mounted on the back surface of said screen for accelerating the through-flow of the liquid, which is conveyed along the back surface of said screen, said guide member being mounted so that S_2 satisfies the equation

$$S_2/\sin\theta < W_2 \cdot \cos\theta$$

wherein S_2 is the thickness of the through-flow water which is conveyed along the back of said screen, W_2 is the distance between the tops of the back surface of the screen and θ is an angle formed between a horizontal plane and the screen, and

(b) a means for cleaning the screen, said cleaning means having a brush, said brush adapted for reciprocation in rubbing contact with the back surface of the screen, and the range of reciprocating motion of said brush being more than the width of said screen.

4,233,160

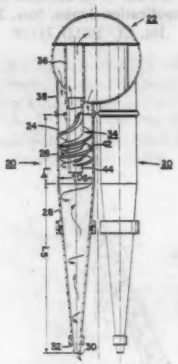
HYDROCYCLONE SEPARATOR ARRANGEMENT

Jacek J. Maciejewicz; Johannes J. Richters, and James E. St. John, all of Calgary, Canada, assignors to Elast-O-Cor Products & Engineering Limited, Calgary, Canada

Division of Ser. No. 831,283, Sep. 7, 1977, Pat. No. 4,163,719.
This application Apr. 17, 1979, Ser. No. 31,012
Int. Cl.² B01D *21/26, 33/02*
U.S. Cl. 210—512 M **8 Claims**

1. A cleaning system for liquid suspensions comprising an elongated combination feed and accept header having a plurality of hydrocyclone separators detachably connected thereto and projecting outwardly therefrom in spaced apart relation therealong, each said hydrocyclone separator including an elongated separator chamber having a large end and an oppo-

sitely disposed small end with a reject outlet therein, the large end of the separator chamber having an annular rim, and a tubular outlet for accept material disposed at said large end in concentric relation to said annular rim, with an annular inlet for feed suspension into said separator chamber being defined between said annular rim and the tubular accept outlet, said feed and accept header including an outer wall and a dividing wall therein to separate feed suspension from accept suspension; a plurality of tubular accept nipples connected to said dividing wall in aligned spaced apart relation for fluid flow therethrough and each being sealingly detachably connected to a respective one of the tubular accept outlets of the hydrocyclone separators; a corresponding plurality of tubular feed



nipples each surrounding a respective one of said accept nipples in spaced concentric relation therewith and connected to said outer wall of the feed and accept header for fluid flow therethrough and means for sealingly detachably connecting each feed nipple to a respective one of the annular rim portions at the large ends of the respective hydrocyclone separators, whereby feed suspension can pass toward the separator chambers of the hydrocyclones through the annular inlets between said feed and accept nipples while permitting accept suspension to pass from each separator chamber through said connected tubular accept outlets and accept nipples and thence through said dividing wall for flow through the feed and accept header.

4,233,161

SUBLIMABLE COMPOSITION

Haruhito Sato; Hiroshi Ichikawa; Hiroshi Hayashi, and Konomu Kurisaki, all of Chiba, Japan, assignors to Idemitsu Kosan Company Limited, Tokyo, Japan

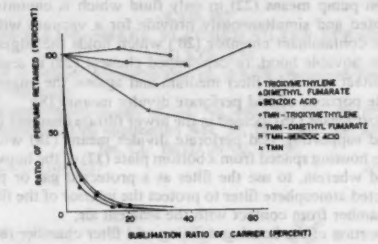
Filed Dec. 20, 1977, Ser. No. 862,620

Claims priority, application Japan, Dec. 25, 1976, 51-155650; Dec. 25, 1976, 51-155652; Mar. 30, 1977, 52-34674; May 21, 1977, 52-58220; May 24, 1977, 52-59360; May 27, 1977, 52-61255; Jun. 7, 1977, 52-66298

Int. Cl.[3] C09K *3/00*; A61K *7/46*

U.S. Cl. 252—1 **19 Claims**

7. A sublimable composition comprising (i) a sublimable hydrocarbon comprising at least one hydrocarbon selected from the group consisting of adamantane, endo-trimethylenenorbornane, cyclododecane, norbornane and trimethylnorbornane and (ii) a sublimable polar compound comprising at least one compound selected from the group consisting of dimethyl fumarate, benzoic acid, trioxymethylene, cumarin, p-dichloro-



benzene, ϵ-caprolactam 1,4-cyclohexanediol, phthalide, lactide and triisopropyltrioxane.

4,233,162

OIL WELL FLUIDS AND DISPERSANTS

Leroy L. Carney, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Division of Ser. No. 677,199, Apr. 15, 1976, Pat. No. 4,108,799, which is a continuation-in-part of Ser. No. 356,239, May 1, 1973, abandoned, Ser. No. 500,999, Aug. 27, 1974, abandoned, and Ser. No. 543,723, Jan. 24, 1975, abandoned, which is a division of Ser. No. 353,060, Apr. 20, 1973, Pat. No. 3,896,031, said Ser. No. 500,999, is a division of Ser. No. 417,431, Nov. 19, 1973, Pat. No. 3,850,248. This application Feb. 7, 1978, Ser. No. 875,722

The portion of the term of this patent subsequent to Jul. 22, 1992, has been disclaimed.

Int. Cl.[3] C09K *7/02*

U.S. Cl. 252—8.5 C **6 Claims**

1. An improved aqueous drilling fluid containing a surfactant-dispersant and a colloidal suspension of asphaltic solids in an aqueous fluid in the absence of oil comprising water and an additive comprised of colloidal asphaltic solids and a surfactant-dispersant comprising a mixture of sulfonated lignin mixed with a fatty acid amide, wherein the fatty acid precursor contains 12–18 carbon atoms and the amine precursor is an alkyl or aryl amino sulfonic acid, wherein the alkyl or aryl radicals contain 1–6 carbon atoms, wherein the fatty acid amide is mixed with said sulfonated lignin in an amount equal to about 25–75% of said mixture and wherein said additive is present in said aqueous drilling fluid in an amount in the range of from about 0.5–2% by weight of the fluid.

4,233,163

CATALYST SYSTEM FOR FLAME RETARDANT FINISHING

Harold McDonald, Harrington Park, N.J., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation of Ser. No. 815,894, Jul. 15, 1977, abandoned, which is a division of Ser. No. 662,474, Mar. 1, 1976, Pat. No. 4,076,650, which is a continuation-in-part of Ser. No. 605,575, Aug. 18, 1975, abandoned. This application Jul. 18, 1978, Ser. No. 925,676

Int. Cl.[2] D06M *13/32, 15/62*

U.S. Cl. 252—8.6 **20 Claims**

1. A composition for flame retarding textiles comprising an unsaturated flame retardant, copper sulfate and hydrogen peroxide wherein said unsaturated flame retardant comprises at least one copolycondensed oligomeric vinylphosphonate consisting essentially of the product resulting from the reaction, in stoichiometric ratio of from about 1:10 to 10:1, between a bis (2-haloalkyl) vinylphosphonate and at least one pentavalent phosphorus ester of the structure ROP(=O)XY where R is selected from the class consisting of C_1—C_{20} alkyl and C_1—C_{20} chloro- or bromoalkyl groups and X and Y are groups selected from the class consisting of RO—, C_1—C_{20} alkyl,

C_2—C_{20} alkenyl, phenyl, phenoxy, amino, C_1—C_{20} alkyl substituted amino, phenyl substituted amino, C_2—C_{20} alkylene bonded to the same or to another ROP(=O) moiety and C_2—C_{20} alkyleneoxy and C_2—C_{20} alkylenedioxy bonded to the same or to another ROP(=O) moiety, wherein said reaction is carried out at an elevated temperature for a period of time sufficient to evolve R-halide as a by-product and to form a P(O)-O-alkylene-O-P(O) linkage, with the proviso that said product is not the homo-condensed product of bis (2-haloalkyl) vinylphosphonate; the weight ratio of said unsaturated flame retardant to the combined weight of copper sulfate and hydrogen peroxide is from about 2:1 to about 20:1 and the weight ratio of copper sulfate to hydrogen peroxide is from about 1:1 to about 1:210.

4,233,164

LIQUID FABRIC SOFTENER

James E. Davis, Cincinnati, Ohio, assignor to The Proctor & Gamble Company, Cincinnati, Ohio

Filed Jun. 5, 1979, Ser. No. 45,710
Int. Cl.³ D06M *13/34, 13/40, 13/46*
U.S. Cl. 252—8.8 **7 Claims**

1. A liquid fabric conditioning composition comprising

(a) from about 2% to about 11% by weight of the composition of non-cyclic quaternary ammonium cationic fabric conditioning agent;

(b) from about 1% to about 5% by weight of the composition of a nonionic fabric conditioning agent selected from the group consisting of:

(i) C_{10}–C_{26} fatty acid esters of mono- or polyhydroxy alcohols containing 1 to 12 carbon atoms; and

(ii) esters of fatty alcohols having from 12 to 24 carbon atoms in the alkyl chain and mono- or poly-carboxylic acids having from 1 to 8 carbon atoms in the alkyl chain; whereby the total number of carbon atoms in the ester is equal to or greater than 16;

(c) from about 0.1% to about 1.3% by weight of the composition of protonated di-polyethoxy mono-alkyl amine;

(d) from about 1% to about 6% by weight of the composition of a lower alcohol; and

(e) water; wherein the total amount of cationic plus nonionic fabric conditioning agents is no more than about 11%.

4,233,165

WELL TREATMENT WITH EMULSION DISPERSIONS

William M. Salathiel; Thomas W. Muecke; Claude E. Cooke, Jr., all of Houston, Tex., and Norman N. Li, Edison, N.J., assignors to Exxon Production Research Company, Houston, Tex.

Filed May 24, 1978, Ser. No. 909,139
Int. Cl.³ C09K *3/00*
U.S. Cl. 252—8.55 R **34 Claims**

13. In a method of treating a subterranean formation surrounding a well in which a treating composition is injected into said formation, the improvement wherein said treating composition comprises a dispersion of a water-in-oil emulsion in an aqueous medium, said emulsion comprising from about 30 to about 95 volume percent of said treating composition and further having an internal aqueous phase and an external oil phase, said external oil phase comprising from about 3 to about 50 volume percent of said emulsion and containing a liquid hydrocarbon and from about 0.5 to about 40 weight percent of a surfactant soluble in said hydrocarbon.

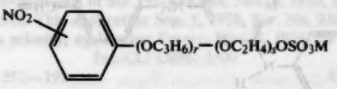
4,233,166

COMPOSITION FOR RECOVERING HYDROCARBONS

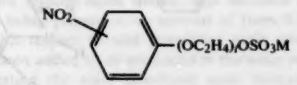
Joseph C. Allen, Bellaire, Tex., assignor to Texaco Inc., White Plains, N.Y.

Division of Ser. No. 871,898, Jan. 23, 1978, Pat. No. 4,186,800. This application Jan. 25, 1979, Ser. No. 6,938
Int. Cl.³ E21B *43/22*
U.S. Cl. 252—8.55 D **4 Claims**

1. A fluid for use in recovering hydrocarbons from subterranean formations comprising water containing from about 0.001 to about 1.0 weight percent of an interfacial tension reducer selected from the group consisting of a compound of the formula:



wherein r is an integer of from 2 to about 5, s is an integer of from 8 to about 60 and M is selected from the group consisting of hydrogen, sodium, potassium and the ammonium ion and a compound of the formula:



wherein t is an integer of from 8 to about 40 and M has the same meaning as previously described.

4,233,167

LIQUID DETERGENT SOFTENING AND BRIGHTENING COMPOSITION

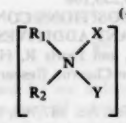
John A. Sramek, Racine, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.

Filed Jun. 14, 1979, Ser. No. 48,411
Int. Cl.² C09K *11/06;* C11D *1/835, 3/42;* D06M *13/46*
U.S. Cl. 252—8.75 **5 Claims**

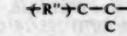
1. An aqueous, stable, liquid detergent composition having enhanced softening and brightening properties comprising:

(a) a water soluble non-ionic surfactant system having a relatively high cloud point in amounts from about 10 to 50% by weight,

(b) a quaternary ammonium fabric softener having an equivalent weight from about 400 to 2000 in amounts from about 0.75 to 6% by weight of the formula:



wherein Z is a water soluble, salt-forming anion, R_1 is a C_{10}–C_{20} alkyl radical, R_2 is R′ or a C_{10}–C_{20} alkyl radical, X and Y are the same or different and are methyl, ethyl, 2-hydroxyethyl, 2-hydroxy propyl, —R″—C—C—O—H, or



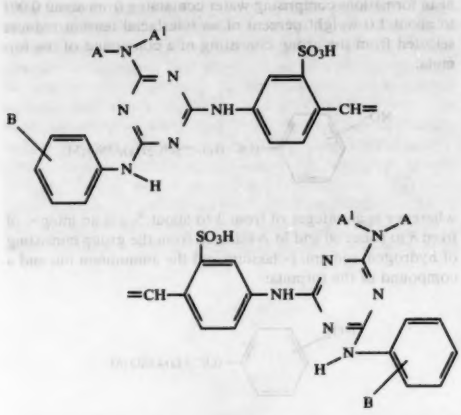
wherein R″ is a polymer having from 1 to 10 ethoxy, isoproxy or mixed ethoxy-isopropoxy units, and R′ is polyethoxy ethanol having from 1 to 10 ethoxy units only when:

(i) X and Y are both methyl, or

(ii) X is methyl and Y is polyethoxyethanol having from 1 to 10 ethoxy units,

(iii) X is ethyl and Y is polyethoxy ethanol having from to 10 ethoxy units;

(c) an optical brightener of the formula:



wherein A and A^1 are the same or different and are hydrogen, methyl, ethyl, isopropyl, 2-hydroxyethyl, propanamido or taken together are morpholino or anilino; B is H, m-SO_3H or p-SO_3H wherein the total number of —SO_3H groups is from 3 to 5, and the salts thereof having water soluble anions, wherein the equivalent weight ratio of (b) to (c) is from about ½:1 to 1:1, wherein the weights are based on the total weight of the aqueous composition;

(d) a hydrotrope is sufficient amounts to maintain a stable composition; and

(e) an aqueous solvent medium wherein said composition has a pH of from 6 to 10.

4,233,168

LUBRICANT COMPOSITIONS CONTAINING DISPERSANT ADDITIVES

Robert A. Lewis, Berkeley, and Lewis R. Honnen, Petaluma, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 887,703, Mar. 17, 1978, abandoned, which is a continuation-in-part of Ser. No. 801,441, May 27, 1977, Pat. No. 4,160,648, which is a continuation-in-part of Ser. No. 730,495, Oct. 7, 1976, abandoned, which is a continuation-in-part of Ser. No. 700,922, Jun. 29, 1976, abandoned, which is a continuation-in-part of Ser. No. 698,243, Jun. 21, 1976, abandoned. This application Jun. 19, 1978, Ser. No. 917,426

The portion of the term of this patent subsequent to Jul. 10, 1996, has been disclaimed.

Int. Cl.[3] **C07C** *125/06;* **C07D** *295/14;* **C10M** *1/32*

U.S. Cl. 252—51.5 A **24 Claims**

1. A lubricating oil composition comprising a major amount of an oil of lubricating viscosity, and a minor amount of a hydrocarbylpoly(oxyalkylene) aminocarbamate of molecular weight from about 600 to 10,000, and having at least one basic nitrogen atom; wherein said poly(oxyalkylene) moiety is composed of oxyalkylene units selected from 2 to 5 carbon oxyalkylene units of which at least a sufficient number are branched chain oxyalkylene units to render said carbamate soluble in said composition; and said hydrocarbyl group contains from 1 to about 30 carbon atoms.

4,233,169

POROUS MAGNETIC GLASS STRUCTURE

George H. Beall, Big Flats; Gerald R. Mansfield, Painted Post, and Jan W. H. Schreurs, Corning, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Apr. 13, 1979, Ser. No. 29,577

Int. Cl.[3] **C03B** *0/00;* **C03C** *3/22, 15/00;* **C04B** *35/26*

U.S. Cl. 252—62.59 **4 Claims**

1. Porous bodies of magnetic glass and/or crystal-containing material with interconnected pores less than 10,000 Å in diameter and having iron-containing, magnetic crystals incorporated therein with dimensions of less than about 1000 Å which are essentially enveloped within the glass and/or crystal structure, wherein said glass consists essentially of a vitreous silica skeleton with said magnetic crystals enveloped therewithin, said crystal-containing material consists essentially of a glassy-crystalline skeleton with said magnetic crystals enveloped therewithin, and said crystal portion of said glassy-crystalline skeleton consists essentially of a silica-containing species.

4,233,170

WATER-GLYCOL HYDRAULIC FLUID CONTAINING POLYOXYALKYLENE ETHERS

Fumihide Genjida; Toyoaki Nasuno; Hideo Kobayashi, and Motohiko Ii, all of Kyoto, Japan, assignors to Sanyo Chemical Industries, Limited, Kyoto, Japan

Filed Jan. 11, 1979, Ser. No. 2,600

Claims priority, application Japan, Feb. 7, 1978, 53-13325

Int. Cl.[3] **C10M** *3/22*

U.S. Cl. 252—73 **20 Claims**

1. A non-flammable hydraulic fluid, which comprises: 5–30% of a water soluble polymer comprising a polyoxyalkylene ether of a polyhydric alcohol having at least five hydroxyl groups and having no nitrogen atom, 30–60% of water and 15–60% of a glycol; wherein said polyoxyalkylene ether has oxalkylene groups comprising both oxyethylene groups and other oxyalkylene groups in random form.

4,233,171

DISHWASHING DETERGENT EFFECTIVE AT LOW TEMPERATURE

Robert L. McLaughlin, Wilmette, and Donald C. Wood, Des Plaines, both of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 872,761, Jan. 27, 1978, Pat. No. 4,187,190, and Ser. No. 737,588, Nov. 1, 1976, abandoned. This application Sep. 11, 1978, Ser. No. 941,185

The portion of the term of this patent subsequent to Feb. 5, 1997, has been disclaimed.

Int. Cl.[3] **C11D** *7/56, 7/18, 7/38*

U.S. Cl. 252—99 **16 Claims**

1. A detergent composition suitable for machine dishwashing at lowered washing temperature which consists essentially of: a chelating agent for sequestering the calcium and magnesium ions expected to be present in the wash water; alkaline material providing an alkalinity of at least 12% alkali metal oxide; a water-soluble oxidizing bleach in an amount supplying about 0.3 to about 3.0 weight percent of the composition of an oxidizing component selected from the group consisting of chlorine and oxygen; and certain combinations of nonionic surfactants:

A. a low-foaming water-soluble polyol which is polyoxypropylene-terminated block copolymer having a polyoxyethylene core;

B. an oil-soluble condensate of about 1 to about 5 moles of ethylene oxide with a hydrophobic organic compound containing a single —OH group; and

C. a high-foaming water-soluble condensate of at least about 7 moles of ethylene oxide with a hydrophobic organic compound containing a single —OH group, all three surfactants being present in at least 1% for a total of at least 7%.

4,233,172

LOW PHOSPHATE CONTENT DISHWASHING DETERGENT

Robert L. McLaughlin, Wilmette, and Donald C. Wood, Des Plaines, both of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 872,761, Jan. 27, 1978, which is a continuation-in-part of Ser. No. 737,588, Nov. 1, 1976, abandoned. This application Oct. 13, 1978, Ser. No. 951,245
The portion of the term of this patent subsequent to Feb. 5, 1997, has been disclaimed.
Int. Cl.[3] C11D 7/56, 7/54
U.S. Cl. 252—99 13 Claims

1. A dry powder, low-phosphate machine dishwashing composition which consists essentially of:

about 10 to about 20 weight percent of a phosphorus-containing compound selected from the group consisting of an alkali metal tripolyphosphate and an alkali metal hexametaphosphate;

at least 8 weight percent of carbonate compounds selected from the group consisting of alkali metal carbonate, bicarbonate or sesquicarbonate, providing a carbonate-to-phosphate weight ratio of about 0.8:1 to about 1.3:1; and

at least about 1 up to about 10 weight percent of said composition of a water-soluble high-foaming nonionic surfactant which is an ethoxylated monohydric compound containing at least about 7 moles of ethylene oxide per mol of monohydric compound, and a foam reducing agent therefor.

4,233,173

DETERGENT COMPOSITIONS CONTAINING DIPOTASSIUM N-CHLOROIMIDODISULFATE BLEACHING AGENT

James M. Mayer, Maryland Heights, and John H. Payne, St. Louis, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Nov. 9, 1978, Ser. No. 959,394
Int. Cl.[3] C11D 7/54; D06L 3/00
U.S. Cl. 252—102 3 Claims

1. A solid detergent formulation comprising at least 5 percent by weight of a surfactant selected from the group consisting of anionic, nonionic, zwitterionic, ampholytic and amphoteric surfactants and mixtures thereof, and a sufficient amount of substantially stable, crystalline dipotassium chloroimidodisulfate to bleach stains on fabrics in an aqueous solution.

4,233,174

QUICK-BREAK CLEANING COMPOSITIONS

Geoffrey P. Sheridan, Manchester, England, assignor to Lankro Chemicals Limited, England

Filed Jan. 12, 1979, Ser. No. 3,121
Claims priority, application United Kingdom, Jan. 19, 1978, 2160/78; Dec. 15, 1978, 48773/78
Int. Cl.[3] C11D 1/70, 1/72, 7/50
U.S. Cl. 252—170 13 Claims

1. A cleaning composition which comprises:

(a) from 35 to 80 wt % of a surfactant selected from the group consisting of a fatty alcohol ethoxylate having from 8 to 18 carbon atoms in the alcohol moiety and from 2 to 10 moles ethylene oxide per mole alcohol, a higher alkyl phenol ethoxylate having from 8 to 12 carbon atoms in the alkyl moiety and from 4 to 10 moles ethylene oxide per mole phenol and mixtures thereof; and

(b) from 65 to 20 wt % of phenol ethoxylate having from 3 to 10 moles ethylene oxide per mole of phenol.

12. A composition as claimed in claim 1 which is a solution in a solvent selected from the group consisting of white spirit, kerosene and gas-oil of about equal parts by weight of a C_{12} to C_{15} fatty alcohol ethoxylate containing about 4 moles of ethylene oxide per mole and about 50% by weight of phenol ethoxylate containing about 4 moles of ethylene oxide per mole.

4,233,175

REAGENT FOR TREATING FLUE GASES AND METHOD OF PREPARATION

Bernard Delmon, Wavre, and Ghislain Van Houte, Louvain, both of Belgium, assignors to Unibra, Brussels, Belgium

Continuation-in-part of Ser. No. 628,663, Nov. 4, 1975, Pat. No. 4,115,518. This application Sep. 1, 1978, Ser. No. 938,973
Claims priority, application France, Nov. 6, 1974, 74 36862
Int. Cl.[2] C09K 3/00
U.S. Cl. 252—192 8 Claims

1. A reagent for treating flue gases consisting of an intimate mixture of a powdered main component selected from the group consisting of calcium, magnesium, and mixed calcium and magnesium oxides, hydroxides, carbonates, bicarbonates, and mixtures thereof, and an additive selected from the group consisting of chloride and bromide salts of alkali metals, ammonium, and alkaline-earth metals, and mixtures thereof, said additive being present in an amount of from 0.1 to 15% by mole with respect to said powdered main component and having been added to or produced in the main component by impregnating the solid powdered main component with a liquid solution of said salt or of the corresponding amount of hydrochloric acid or hydrobromic acid and removing the solvent by drying.

4,233,176

NON-PETROLEUM BASED METAL CORROSION INHIBITOR

Alvin J. Conner, Sr., 2156 Agriculture St., New Orleans, La. 70122

Filed May 9, 1979, Ser. No. 37,418
Int. Cl.[2] C23F 11/14, 11/12
U.S. Cl. 252—392 16 Claims

1. A non-petroleum based metal corrosion inhibiting composition consisting essentially of a solution of one part by weight of an aqueous concentrate and up to five parts by weight of water, said aqueous concentrate comprising, per 100 parts by weight of the concentrate:

(a) 5 to 20 parts by weight of a monobasic organic acid having from 8 to 20 carbon atoms;

(b) 0.5 to 4 parts by weight of a lubricant;

(c) 0.5 to 4 parts by weight of an alkylaminoalkanolamine of the formula:

$$H_2NR^1-\underset{\displaystyle R^3}{\overset{|}{N}}-R^2-OH$$

where R^1 and R^2 are independently alkylidene of 1–4 carbon atoms, and R^3 is hydrogen or alkyl of 1–4 carbon atoms;

(d) 10 to 35 parts by weight of benzoic acid; and

(e) 5 to 20 parts by weight of an amine which forms a water soluble salt with benzoic acid.

4,233,177

PROPELLANT OF REDUCED COMBUSTIBILITY

Augustinus J. M. Wittenhorst, Westerburg, Fed. Rep. of Germany, assignor to Von Treu AG, Switzerland

Filed Jul. 28, 1978, Ser. No. 929,199
Claims priority, application Fed. Rep. of Germany, Jul. 30, 1977, 2734490
Int. Cl.[3] E09K 3/30
U.S. Cl. 252—305 5 Claims

1. A propellant for aerosols free from fluorochlorohydrocarbons and having reduced combustibility having as the predominant component at least one liquified hydrocarbon of the group consisting of propane, isobutane and butane, 2 to 20 weight % of at least one chlorohydrocarbon of the group consisting of dichloromethane and 1,1,1-trichloroethane and 0.5 to 10 weight percent of an inert gas of the group consisting

of carbon dioxide, nitrous oxide and noble gases based on the total amount of liquified hydrocarbon and chlorohydrocarbon.

4,233,178

MICRO-CAPSULES AND METHOD FOR THEIR PRODUCTION

Mitsuru Fuchigami, Takasago, Japan, assignor to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed Sep. 27, 1978, Ser. No. 946,376
Claims priority, application Japan, Sep. 28, 1977, 52-116249
Int. Cl.[3] B01J *13/02*
U.S. Cl. 252—316 **8 Claims**

1. A method of producing micro-capsules containing a hydrophobic material comprising the steps of dispersing the hydrophobic material in an acidic aqueous solution of a styrene-maleic anhydride copolymer as dispersing agent or emulsifier for said hydrophobic material, adding to the dispersion a melamine-formaldehyde precondensate, and heating the mixture in a acidic state to harden the melamine-formaldehyde precondensate to form the wall of the microcapsule.

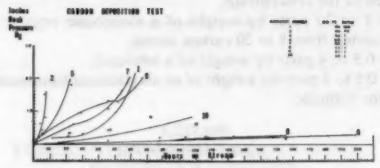
8. Micro-capsules containing the hydrophobic material produced according to the method of claim 1.

4,233,179

PROCESS FOR STEAM REFORMING OF HYDROCARBONS

Karl J. Russ, Louisville, Ky., and Donald R. Broughton, Lanesville, Ind., assignors to United Catalysts Inc., Louisville, Ky.

Filed Dec. 8, 1975, Ser. No. 638,505
Int. Cl.[2] C01B *3/40*
U.S. Cl. 252—373 **7 Claims**



1. A process for the steam reforming of normally liquid hydrocarbons to produce hydrogen and the oxides of carbon which comprises the steps of:

A. passing said normally liquid hydrocarbons and steam at a ratio of about 1.5 to about 5 mols of steam per atom of carbon in said normally liquid hydrocarbons and at a pressure in the range of from about 1 to 50 atmospheres and at a temperature in the range of from 800 to 1800 degrees F. over a catalyst comprising catalytically active constituents for said reaction impregnated onto a low surface area refractory support

B. the improvement in which said catalytically active constituents comprise nickel, expressed as the metal, in a weight concentration of from about five to thirty percent and promotional amounts of the oxides of manganese and iron, in which the ratio of manganese to iron, expressed as the metal, does not exceed 2:1 and in which:

1. said catalytically active constituents are not chemically bound to said refractory support, having been impregnated onto said low surface area refractory support from a solution of their heat decomposable water soluble salts, followed by calcination at a temperature of at least 700° F. but not in excess of 1200° F. for sufficient time to convert each of said salts to the oxide.

4,233,180

PROCESS FOR THE CONVERSION OF CARBON MONOXIDE

Arthur L. Hausberger, and Edward K. Dienes, both of Louisville, Ky., assignors to United Catalysts Inc., Louisville, Ky.

Division of Ser. No. 859,271, Dec. 9, 1977, Pat. No. 4,153,580.
This application Nov. 13, 1978, Ser. No. 960,485
Int. Cl.[3] C01B *2/10*
U.S. Cl. 252—373 **8 Claims**

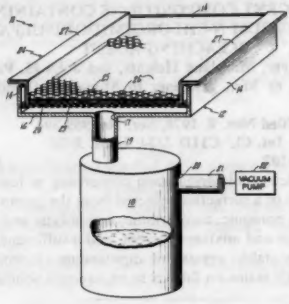
1. A process for the catalytic conversion of carbon monoxide with steam to form hydrogen and carbon dioxide in the presence of a catalyst which comprises the step of passing a reaction mixture comprising carbon monoxide and steam at a temperature of from 300° to 1000° F., but above the dew point temperature of said reaction mixture and at a pressure below the dew point pressure of said reaction mixture but within the range of from 1 to 200 atmospheres over a catalyst comprising a compound of molybdenum supported on a stabilized aluminous support comprising aluminum oxide in the gamma phase in intimate association with a rare earth metal oxide of the lanthanum series.

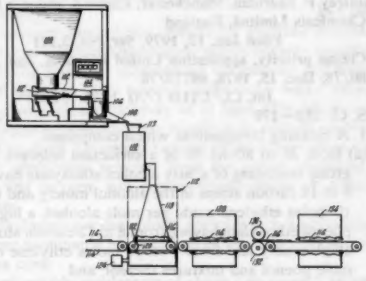
4,233,181

AUTOMATED CATALYST PROCESSING FOR CLOUD ELECTRODE FABRICATION FOR FUEL CELLS

Glen J. Goller, West Springfield, Mass., and Richard D. Breault, Coventry, Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed May 30, 1979, Ser. No. 43,917
Int. Cl.[3] H01M *4/88, 4/04, 4/96*
U.S. Cl. 252—425.3 **11 Claims**





1. The method of making an electrochemical cell catalyst material comprising the steps of:

forming an aqueous co-suspension of polytetrafluoroethylene particles and catalyzed carbon to form a floc suspension;

forming pellet shapes within a mold, the mold including a

plurality of pellet shaped cavities with a porous filter medium forming the bottoms of the cavities, the step of forming pellet shapes including filling the mold cavities with the floc suspension and filtering out the excess liquids through the filter medium without the application of significant pressure leaving uncompressed wet floc solids within the mold cavities;

drying the pellet shapes within the mold cavities at temperatures no greater than about 150° F. for form dry, uncompressed floc pellets; and

removing the pellets from the mold cavities.

8. In a method for applying a catalyst layer to the surface of electrochemical cell electrode substrates, the steps of:

forming an aqueous co-suspension of catalyzed carbon particles and polytetrafluoroethylene particles;

causing the carbon particles and polytetrafluoroethylene particles to floc and maintaining the floc in suspension;

forming the floc into pellet shapes at essentially atmospheric pressure by pouring the suspension into a mold comprising a plurality of pellet shaped mold cavities with a porous filter medium forming the bottoms of the mold cavities, drawing a vacuum under the filter medium to draw excess liquid through the filter medium, wherein substantially uncompressed wet floc solids remain behind in the mold cavities;

drying the pellet shapes within the mold cavities at temperatures no greater than about 120° F. to form dry, uncompressed floc pellets;

removing the dry floc pellets from the mold;

placing the pellets in a hopper;

automatically feeding, at spaced intervals, a predetermined amount of pellets from the hopper into grinding apparatus, the pre-determined amount of pellets being the amount necessary to apply a dry floc layer of certain catalyst loading to a single electrode substrate;

grinding the predetermined amount of pellets in the grinding apparatus to form a powder having a maximum floc particle size of about 5 microns;

applying the powder in dry form, as a uniform layer, directly from the grinding apparatus onto the surface of an electrochemical cell electrode substrate;

compacting the layer; and

sintering the layer.

4,233,182

HIGH ACTIVITY CATALYST FOR THE POLYMERIZATION OF ALPHA-OLEFINS

Glen R. Hoff, Naperville, Ill., and Peter Fotis, Highland, Ind., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Dec. 26, 1978, Ser. No. 973,108

Int. Cl.³ C08F *4/62, 4/64, 4/68, 4/02*

U.S. Cl. 252—429 C **45 Claims**

1. An alpha-olefin polymerization catalyst comprising (A) an organometallic promoter selected from the group consisting of Group IA, IIA, IIB, IIIA, and IVA metal alkyls, hydrides, alkylhydrides, and alkylhalides; and (B) a solid, hydrocarbon insoluble component which is the reaction product of components comprising (1) at least one compound of a Group IVB, VB or VIB metal, (2) at least one divalent metal salt of a phosphorus acid ester, said salt containing the structure

$$-M-Y-\overset{\overset{Y}{\|}}{P}(YR)A$$

wherein M is a divalent Group IIA, IIB, IVA, VIIB, or VIII metal, each Y is independently oxygen or sulfur, A is hydrogen, —YH, R, or —YR, and each R is independently an organic radical or a halo- or amino-substituted organic radical, said organic radical being an alkyl radical of 1 to about 12 carbon atoms, an aryl radical of 6 to about 10 carbon atoms, or an alkaryl or aralkyl radical of 7 to about 12 carbon atoms, and (3) at least one alkylaluminum halide, wherein the atomic ratio of metal contained in (1) to metal contained in (2) ranges from about 0.05:1 to about 10:1 and the amount of (3) employed is at least effective to halide the metal contained in (1) and (2); said reaction being carried out under substantially anhydrous conditions.

4,233,183

PROCESS FOR PRODUCING PLATE-SHAPED DENITRATING CATALYST

Hideya Inaba; Kenichi Nagai; Yasumi Kamino, and Kazuo Maeda, all of Osaka, Japan, assignors to Hitachi Shipbuilding & Engineering Co., Ltd., Osaka, Japan

Filed Feb. 6, 1979, Ser. No. 9,962

Int. Cl.³ B01J *35/04*

U.S. Cl. 252—432 **9 Claims**

1. A process for producing a catalyst for reducing nitrogen oxides in exhaust gases and comprising the steps of preparing a slurry from hydrated titania and a sol selected from the group consisting of silica sol, alumina sol and titania sol, firing the slurry to obtain a porous material, pulverizing the porous material to a powder, supporting the powder on a metal net with an inorganic dehydration-condensed binder and filling the openings of the net to form a plate-like piece having the metal net as its core, drying or firing the piece to obtain a porous carrier and depositing a catalytically active component on the porous carrier.

4,233,184

ALUMINUM PHOSPHATE-ALUMINA COMPOSITIONS AND CATALYSTS COMPRISING THE SAME

Neville L. Cull, Baker, La., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Jan. 18, 1979, Ser. No. 4,456

Int. Cl.³ B01J *27/14, 31/12*

U.S. Cl. 252—437 **26 Claims**

1. An aluminum phosphate-alumina composition prepared by the steps which comprise reacting a mixture comprising an aluminum alkoxide and an organic phosphate having the formula $(RO)_3PO$ wherein R is a hydrocarbon radical selected from the group consisting of alkyl, aryl, cycloalkyl, alkaryl, aralkyl radicals and mixtures thereof, in the presence of moist air, to form an aluminum phosphate-alumina precipitate, and separating said aluminum phosphate-alumina precipitate from said mixture.

4,233,185

CATALYSTS FOR OXIDATION AND REDUCTION

Arthur G. Knapton, Henley on Thames, and Ian R. McGill, Thatcham, both of England, assignors to Johnson, Matthey & Co., Limited, London, England

Filed Nov. 29, 1977, Ser. No. 855,698

Claims priority, application United Kingdom, Dec. 8, 1976, 51219/76

Int. Cl.³ B01J *23/10, 23/64*

U.S. Cl. 252—462 **17 Claims**

1. A catalyst suitable for use in oxidation and reduction reactions comprising a substrate carrying a coating comprising at least one intermetallic compound selected from the group consisting of $TiPt_3$, LnPd, $LnPd_3$, Ln_5Pd_2 (where Ln=Sm, Gd, Dy, Ho and Er), $TaIr_3$, $NbIr_3$, TaPd, TiRu, NbIr, $TaRh_3$, $NbRh_3$, VIr_3 and $CeRu_2$.

4,233,186

CATALYSTS FOR WATER DEALKYLATION OF AROMATIC HYDROCARBONS

Daniel Duprez, Poitiers, and Michel Grand, Serezin du Rhone, both of France, assignors to Elf Union, Paris, France

Filed Mar. 16, 1979, Ser. No. 21,193

Claims priority, application France, Mar. 20, 1978, 78 07987

Int. Cl.[3] B01J *21/04, 23/40, 23/70, 23/72*

U.S. Cl. 252—466 B 13 Claims

1. In a water dealkylation catalyst for petroleum fractions containing monoalkylated or polyalkylated aromatic hydrocarbons including at least one metal of group VIII deposited in a proportion of from 0.1 to 5% by weight on a spinel having improved activity, selectivity and stability, the improvement which comprises a carrier of mixed spinel of the formula $(M_xM'_{1-x})Al_2O_4$ wherein M is a bivalent base metal of group VIII of the Periodic Table, M' is a bivalent metal selected from groups 2a, 7b, 1b and 2b of the Periodic Table, wherein the molar ratio M/M' is from about 0.5:1 to 50:1 and wherein x is the molar fraction of M.

4,233,187

CATALYST AND PROCESS FOR STEAM-REFORMING OF HYDROCARBONS

Kenton Atwood, New Albany, Ind.; James H. Wright, Louisville, and Jay S. Merriam, La Grange, both of Ky., assignors to United Catalysts Inc., Louisville, Ky.

Continuation-in-part of Ser. No. 817,160, Jul. 20, 1977, abandoned, and a continuation-in-part of Ser. No. 708,941, Jul. 27, 1976, abandoned. This application Mar. 26, 1979, Ser. No. 24,005

Int. Cl.[3] B01J *21/04, 23/74, 35/02*

U.S. Cl. 252—466 J 2 Claims

1. A hydrocarbon reforming catalyst comprising a cylindrical refractory support consisting essentially of alumina in the alpha phase, said support having a surface area of not more than 15 square meters per gram and having two or more gas passages extending axially therethrough from one end to the other and a catalytically active amount of nickel or cobalt oxide deposited there upon in a concentration of from 6 to 30% by weight expressed as the metal, said catalyst having a Relative Activity Coefficient Factor (ACF^R) and a Relative Pressure Factor (PF^R) in excess of that when compared to a standard ring, said (ACF^R) being in excess of 1 and the ratio of said (ACF^R) to said (PF^R) being in excess of 1:1, the height (H) of said support bearing a relationship to the effective internal diameter of each of said gas passages (ID), the ratio of H:ID being less than 4:1.

4,233,188

CATALYST FOR TREATING EXHAUST GAS FROM AN INTERNAL COMBUSTION ENGINE

Haren S. Gandhi, Farmington Hills, and Mordecai Shelef, Birmingham, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Continuation of Ser. No. 963,540, Nov. 24, 1978, abandoned, which is a continuation-in-part of Ser. No. 830,277, Sep. 1, 1977, abandoned, which is a division of Ser. No. 705,642, Jul. 15, 1976, abandoned, which is a continuation-in-part of Ser. No. 607,659, Aug. 25, 1975, abandoned. This application Aug. 6, 1979, Ser. No. 64,317

Int. Cl.[3] B01J *23/44, 23/46, 23/64, 23/74*

U.S. Cl. 252—470 3 Claims

1. A catalyst for treating oxides of nitrogen, carbon monoxide and unburned hydrocarbons found in an exhaust gas stream from an internal combustion engine operating with an air/fuel feed system capable of producing air/fuel ratios which vary as much as 1.0 units of air/fuel ratio to the rich and lean sides of a stoichiometric ratio, which catalyst comprises:

a substrate having a high surface area to volume ratio;

a selective three-way equilibrium catalyst formed of iridium present on said substrate in an amount from about 10 ppm to about 5,000 ppm, said selective three-way equilibrium catalyst being a catalyst having excellent three-way selectivity when treating exhaust gases produced by burning air/fuel mixtures of about stoichiometric proportions

an oxygen storage material on said substrate selected from the group of base metals or base metal oxides which can undergo rapid changes in oxidation state, said oxygen storage material being present in an amount from about 500 ppm to about 50,000 ppm, said oxygen storage material being capable of temporarily withdrawing and storing oxygen from exhaust gases produced when air/fuel mixtures having more oxygen present than necessary to burn all the fuel present are burnt, whereby during brief oxygen rich periods said oxygen storage material can take up oxygen and the catalyst operate as if the air/fuel ratio was stoichiometric;

a catalyst selected from the group consisting of nickel and tungsten, said catalyst being present on said substrate in an amount from about 500 ppm to about 10,000 ppm, said catalyst being effective to remove carbon monoxide and unburned hydrocarbons from exhaust gases produced when air/fuel mixtures having more fuel than can be completely oxidized by the oxygen present in the mixture are burnt; and

an oxidation catalyst formed from palladium, said oxidation catalyst being present on said catalyst substrate from about 500 ppm to about 10,000 ppm, said oxidation catalyst being effective under conditions in which sufficient oxygen is available in the exhaust gases for oxidizing carbon monoxide and unburned hydrocarbons.

4,233,189

CATALYST OF RHODIUM ON ZIRCONIA

Haren S. Gandhi, Farmington Hills; Joseph T. Kummer, Ypsilanti; Mordecai Shelef, Birmingham; Henryk K. Stepien, and Hsien C. Yao, both of Dearborn Heights, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Mar. 12, 1979, Ser. No. 19,816

Int. Cl.[3] B01J *21/06, 23/46*

U.S. Cl. 252—472 2 Claims

1. A catalyst system which comprises:

a substrate;

a washcoat on said substrate, said washcoat consisting essentially of zirconia; and

a catalyst on said washcoat, said catalyst consisting essentially of rhodium.

4,233,190

PROCESS FOR THE PRODUCTION OF CARBON DIOXIDE ABSORPTION AGENT PELLETS FOR USE IN RESPIRATORY EQUIPMENT

Jürgen Schäfer, Frankfurt, Fed. Rep. of Germany, assignor to Drägerwerk Aktiengesellschaft, Fed. Rep. of Germany

Division of Ser. No. 892,038, Mar. 31, 1978. This application Jul. 17, 1979, Ser. No. 58,241

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1977, 2715635

Int. Cl.[3] B01J *23/02*

U.S. Cl. 252—475 3 Claims

1. A process for the production of carbon dioxide absorption agent pellets for respiratory equipment using a moving conveyor having a surface with shaped depressions therein, comprising finely grinding lime and adding water to it by continuously moving the water and lime through a slaking zone to slake the lime, continuously moving the slaked line through a kneading zone in which the lime is continuously kneaded to form it into a pasty mass, continuously pressing the pasty mass into the shaped depressions of the conveyor, drying the mass while it is in the depressions to form the mass into carbon dioxide absorption pellets, and ejecting the pellets from the conveyor depression conveyors.

4,233,191

ELECTRICALLY CONDUCTIVE PLASTICS MATERIALS AND PROCESS FOR THEIR PRODUCTION

Franz G. Reuter, Lemförde, and Tankred Menzel, Bad Essen, both of Fed. Rep. of Germany, assignors to Reuter Technologie GmbH, Lemförde, Fed. Rep. of Germany

Filed Mar. 23, 1978, Ser. No. 889,487
Int. Cl.[2] H01B 1/06
U.S. Cl. 252—511 13 Claims

1. A method of producing a thermoplastically further processable, electrically conductive plastic material from polymers and electrically conductive particles, comprising the steps of (1) mixing an aqueous dispersion of a thermoplastic synthetic resin with an aqueous dispersion of the electrically conductive particles, (2) spreading out the resulting mixture in a thin layer on a substrate, (3) subsequently evaporating water from the mixture at a temperature above the softening point of the synthetic resin, and (4) subsequently removing the formed electrically conductive plastic material layer from the substrate.

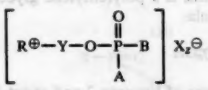
4,233,192

DETERGENT COMPOSITIONS

Martin K. O. Lindemann, Bridgewater, and Robert J. Verdicchio, Succasunna, both of N.J., assignors to Johnson & Johnson, New Brunswick, N.J.

Filed Nov. 30, 1978, Ser. No. 965,463
Int. Cl.[2] C11D 3/36, 7/36
U.S. Cl. 252—545 10 Claims

1. A detergent and cleansing composition wherein the active ingredient consists essentially of from about 1 to 20% by weight of the total composition of a compound selected from the group consisting of a phosphobetaine of the formula



(I)

wherein

A is selected from O^-, OM, and —O—Y—R^+;

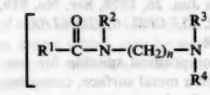
B is selected from O^- and OM';

X^- is an anion;

z is an integer from 0 to 2;

with the proviso that only one of A and B can be O^- and z is of a value necessary for charge balance;

R is an amidoamine reactant moiety of the formula



wherein

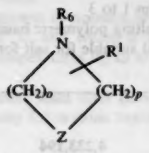
R^1 is alkyl, alkenyl, alkoxy, or hydroxyalkyl of from 5 to 22 carbon atoms each, or aryl or alkaryl of up to 20 carbon atoms;

R^2 is hydrogen or alkyl, hydroxyalkyl or alkenyl of up to 6 carbon atoms each or cycloalkyl of up to 6 carbon atoms, or polyoxyalkalene of up to 10 carbon atoms;

R^3 and R^4, which may be the same or different, are selected from alkyl, hydroxyalkyl, carboxyalkyl of up to 6 carbon atoms in each alkyl moiety, and polyoxyalkylene of up to 10 carbon atoms; in addition, R^3 and R^4 taken together with the nitrogen to which they are attached, may represent an N-heterocycle structure, in which the Y radical is bonded to a ring atom of said N-heterocycle other than the nitrogen of the R moiety;

n is an integer from 2 to 12;

or R is an N-heterocyclic radical of the formula



wherein

Z is N, S or O;

o is an integer from 0 to 3;

p is an integer from 1 to 3; provided that the sum of o+p is from 3 to 4;

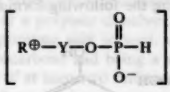
R^1 is defined as before and is linked to a ring carbon atom; and

R_6 is alkyl of from 2 to 6 carbon atoms;

Y is alkylene of up to 12 carbon atoms;

M and M', which may be the same or different, are (a) hydrogen, (b) an organic radical selected from alkyl or hydroxyalkyl of up to 6 carbon atoms, polyhydroxyalkyl of up to 10 carbon atoms, glyceryl, cycloalkyl of up to 6 carbon atoms, aryl or arylalkyl of up to 10 carbon atoms, or (c) a salt radical selected from alkali metals, alkaline earth metals, and mono-, di- or triethanolamine, provided that when either M or M' is an organic radical (b), the other M and M' must be hydrogen or a salt radical (c);

or a phosphitaine of the formula



wherein R and Y are as defined above.

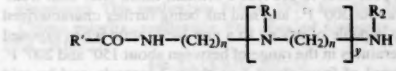
4,233,193

SALTS OF POLYMERIC BASIC AMIDES

Richard Hochreuter, Oberwil, and James R. Runyon, Therwil, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Division of Ser. No. 777,469, Mar. 14, 1977, Pat. No. 4,139,689, which is a continuation of Ser. No. 596,286, Jul. 16, 1975, abandoned, which is a continuation of Ser. No. 333,485, Feb. 20, 1973, abandoned. This application Oct. 18, 1978, Ser. No. 952,298
Int. Cl.[3] C08F 8/32
U.S. Cl. 260—18 N 14 Claims

1. A water dispersible polymeric amide salt produced by reacting, at a temperature above 100° C., (1) a polymer containing carboxyl groups and selected from the group consisting of oxidized polyethylene having a molecular weight from 700 to 7000 and an acid number from 10 to 120 and copolymers formed by copolymerizing ethylene and an unsaturated aliphatic carboxylic acid of 3 to 8 carbon atoms, which copolymers have a molecular weight of from 1000 to 6000, an acid number of 20 to 100 and a molecular proportion of acid component in the range 0.2 to 24% with (2) a polyamine of the formula,



in which

R_1 and R_2 are each, independently, hydrogen or unsubstituted alkyl of 1 to 3 carbon atoms,

R' is a linear or branched unsubstituted alkyl or alkenyl radical of 11 to 21 carbon atoms,

n is an integer 2 or 3, and

y is an integer from 1 to 3

and reacting the resulting polymeric basic amide with an inorganic or organic acid suitable for salt formation.

4,233,194

WATER-DISPERSED FILM-FORMING LACQUER CONTAINING AIR-DRYING ALKYD RESINS AND AN ETHYLENE OXIDE ADDUCT OF AN UNSATURATED ALIPHATIC-SUBSTITUTED PHENOL

Helmut Eschwey, Düsseldorf-Benrath, Fed. Rep. of Germany; Joachim Galinke, deceased, late of Langenfeld, Fed. Rep. of Germany (by Renate Galinke nee Jansen, heir), and Norbert Wiemers, Monheim-Baumberg, Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien (Henkel KGAA), Düsseldorf-Holthausen, Fed. Rep. of Germany

Filed Dec. 4, 1978, Ser. No. 966,367

Claims priority, application Fed. Rep. of Germany, Dec. 5, 1977, 2754091

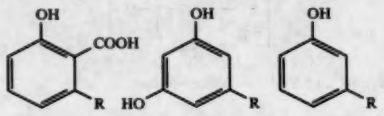
Int. Cl.³ B32B *9/00, 17/10;* **C09D** *3/64*

U.S. Cl. 260—22 A **9 Claims**

1. An aqueous-dispersed film-forming vehicle suitable for lacquers and lacquer binding agents comprising a content of:

(a) at least one water-insoluble air-drying alkyd resin;

(b) at least one nonionic surfactant consisting essentially of an adduct of ethylene oxide onto an aliphatic-substituted phenolic compound selected from the group consisting of cardanols having the following formulae:



where R is a mixture of $C_{15}H_{31}$, $C_{15}H_{29}$, $C_{15}H_{27}$ and $C_{15}H_{25}$, said adduct containing 5 to 40 ethylene oxide units per mol of the phenolic compound; and

(c) an aqueous dispersion medium.

4,233,195

METALLIC PRINTING INKS AND METALLIZED PAPERS PRINTED THEREWITH

W. Ralph Mills, Richmond, Va., assignor to Reynolds Metals Company, Richmond, Va.

Filed Feb. 26, 1979, Ser. No. 15,409

Int. Cl.³ C09C *1/62, 3/10;* **C09D** *11/10*

U.S. Cl. 260—23 S **17 Claims**

1. A metallic printing ink comprising a thermoplastic resin selected from the group consisting of substituted styrene copolymer resins, chlorinated rubber, and styrene resins; a leafing grade aluminum paste; and a solvent selected from the group consisting of toluene, methyl ethyl ketone, methyl isobutyl ketone, and mixtures thereof, said printing ink being applicable to coated papers and to uncoated papers and to plastics by printing processes to provide a brilliant finish after heat treatment at about 300° F.; and said ink being further characterized by being capable of drying to a non-tacky state when exposed to temperatures in the range of between about 150° and 200° F. for a period of from about 1 to about 3 seconds, and by said thermoplastic resin being sufficiently soft as to permit leafing of said leafing grade paste when said ink is applied as a printed coating on a paper base and said paper base is then passed over a roller heated to a temperature of between about 200° and about 400° F. for about 0.5 seconds of contact with said roller.

4,233,196

POLYESTER AND POLYESTERAMIDE COMPOSITIONS

Bobby J. Sublett, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 30, 1979, Ser. No. 34,226

Int. Cl.³ C08J *3/02;* **C08G** *63/68*

U.S. Cl. 260—29.2 N **14 Claims**

1. A textile fiber sizing composition comprising an aqueous dispersion containing from about 0.1 to about 50% by weight, based on the combined weight of polymer and water, of a linear, water-dissipatable polymer having carbonyloxy linking groups in he linear molecular structure wherein up to 80% on the linking groups may be carbonylamido linking groups, the polymer having an inherent viscosity of at least about 0.1 measured in a 60/40 parts by weight solution of phenol/tetrachloroethane at 25° C. and at a concentration of about 0.25 gram of polymer in 100 ml. of the solvent, the polymer containing substantially equimolar proportions of acid equivalents (100 mole percent) to hydroxy and amino equivalents (100 mole percent), the polymer comprising the reaction products of (a), (b), and (c) from the following components or ester forming or ester-amide forming derivatives thereof;

(a) at least one difunctional dicarboxylic acid;

(b) from about 4 to about 25 mole percent, based on a total of all acid, hydroxyl and amino equivalents being equal to 200 mole percent, of at least one difunctional sulfomonomer containing at least one metal sulfonate group attached to aromatic nucleus wherein the functional groups are hydroxy, carboxyl or amino; and

(c) at least one difunctional reactant selected from a glycol or a mixture of a glycol and diamine having two —NRH groups, the glycol containing two —CH_2—OH groups of which from about 0.1 to less than 15 mole percent based on the total mole percent of hydroxy or hydroxy and amino equivalents, is a poly(ethylene glycol) having the structural formula:

$$H\text{-}(OCH_2\text{-}CH_2)_n\text{-}OH$$

n being an integer of between 2 and about 500, and with the proviso that the mole percent of said poly(ethylene glycol) within said range is inversely proportional to the quantity of n within said range.

4,233,197

WATER-BORNE COATING FOR METAL SURFACES

John K. Howell, Jr., North Branch, Mich., assignor to Oxy Metal Industries Corporation, Warren, Mich.

Division of Ser. No. 818,184, Jul. 22, 1977, abandoned. This application Jun. 26, 1978, Ser. No. 919,193

Int. Cl.² C08L *61/20, 63/00*

U.S. Cl. 260—29.4 R **7 Claims**

1. An aqueous composition suitable for use in forming a protective coating on a metal surface, comprising:

(a) an epoxy resin having an average molecular weight of about 900 to 2,900 and about 2.7 to 11.6 hydroxyl equivalents per mole;

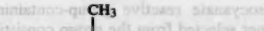
(b) melamine-formaldehyde resin alkylated with at least one alcohol of from 1 to 4 carbon atoms in a weight ratio of epoxy resin:melamine-formaldehyde resin of from 2:1 to 20:1;

(c) an acid catalyst which is an ammonium salt of an anion of the formula:

$$R\text{—}O\text{-}(CH_2CH_2O)_m\text{-}SO_3^-$$

wherein R is an alkyl or alkyl aryl group of at least 10 carbon atoms and containing a saturated alkyl portion and m is in the range of about 4 to 30 in an amount sufficient to effect cross linking of the epoxy resin and melamine-formaldehyde resin;

(d) a block copolymer of general formula



having an HLB in excess of 22 and a molecular weight in the range of about 5,000 to 14,000 in an amount of about 2 to 12 wt. % of the total of the epoxy and melamine-formaldehyde resin; and

(e) water, the balance,

wherein the total of the components (a), (b), (c) and (d) concentrations ranges from 5 to 85 wt. % of the aqueous composition.

4,233,198

AQUEOUS VINYL POLYMER DISPERSION EMULSIFIED WITH AN ALKANE PHOSPHONIC ACID DERIVATIVE

Ernst Nölken, Frankfurt am Main, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 27, 1978, Ser. No. 946,378

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1977, 2743764

Int. Cl.³ C08F *2/26*

U.S. Cl. 260—29.6 MP **8 Claims**

1. An aqueous plastics dispersion containing a vinyl polymer and an emulsifier wherein the emulsifier is a water-soluble salt of an alkane-phosphonic acid of the formula

or of an alkane phosphonic acid monoalkyl ester of the formula

or a mixture of such salts and wherein: R is an alkyl radical of 6 to 24 carbon atoms which may be substituted by a phenyl, hydroxyl or carboxyl radical, and R^1 is an alkyl radical of 1 to 8 carbon atoms.

4,233,199

FLAME RESISTANT THERMOPLASTIC COMPOSITIONS WITH WELL BALANCED PHYSICAL PROPERTIES

Visvaldis Abolins, 15 Haddington La., Delmar, N.Y. 12054; Fred F. Holub, 2263 Preisman Dr., Schenectady, N.Y. 12305, and Popkin R. Shenian, 46 Tamarack Dr., Delmar, N.Y. 12054

Filed Jul. 3, 1979, Ser. No. 54,404

Int. Cl.² C08K *5/52*

U.S. Cl. 260—30.6 R **13 Claims**

1. A thermoplastic composition comprising:

(a) a polyphenylene ether resin;

(b) a styrene type resin;

(c) an organophosphorus compound having a melting point below about 100° C. and which is stable and relatively non-volatile at temperatures up to at least about 300° C.; and

(d) a finely particulate solid filler having a relatively high absorption capacity for organic liquids.

4,233,200

METHOD OF SIZING TEXTILE YARNS AND SIZING AGENTS THEREFOR

Herbert Fink, Bickenbach; Egon Grumbach, Darmstadt, and Horst Pennewiss, Darmstadt-Neu-Kranichstein, all of Fed. Rep. of Germany, assignors to Röhm GmbH, Darmstadt, Fed. Rep. of Germany

Filed Feb. 23, 1979, Ser. No. 14,765

Claims priority, application Fed. Rep. of Germany, Apr. 17, 1978, 2816515

Int. Cl.³ C08K *5/02*

U.S. Cl. 260—33.8 UA **10 Claims**

1. A method for sizing a textile yarn which comprises treating said yarn with a sizing solution comprising from 2.5 to 15 percent by weight of a polymer dissolved in an organic solvent, and then evaporating said solvent, said polymer being soluble in halohydrocarbons and being a saturated block copolymer comprised of at least two different unsaturated polymerizable hydrocarbons having two separated softening regions, one of which regions is below +20° C. and one of which regions is above +20° C., and wherein the blocks having the higher softening region form the disperse phase.

4,233,201

Patent Not Issued For This Number

4,233,202

PROCESS FOR THE PURIFICATION OF EPOXY COMPOUNDS

Dieter Berger; Wilfried Bartz, and Wolfgang Seeliger, all of Marl, Fed. Rep. of Germany, assignors to Chemische Werke Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 563,163, Mar. 28, 1975, abandoned. This application Feb. 4, 1977, Ser. No. 765,722

Claims priority, application Fed. Rep. of Germany, Apr. 3, 1974, 2416227

Int. Cl.³ C07D *301/32*

U.S. Cl. 260—348.36 **10 Claims**

1. A process for the separation of the low molecular water-soluble onium-catalyst dissolved in the liquid mixture of epoxy resin and epihalohydrin obtained by the reaction in the presence of base of a compound having —OH, —SH, —COOH or =NH groups with excess 1-halo-2,3-epoxyalkane, consisting

essentially of contacting the liquid mixture, either prior to or after separation therefrom of the precipitated salt produced by the reaction, with at least about 5 parts by weight based on the weight of the catalyst present in the liquid mixture, of an adsorbent containing or capable of absorbing at least 1% by weight of water so strongly that it cannot be removed either by drying over concentrated sulfuric acid or by drying at 110° C. and can only be partially removed by drying at 200° C. under vacuum (about 1 millibar), and then separating the adsorbent with catalyst adsorbed thereon from the liquid mixture.

4,233,203

MOLDABLE THERMOSETTING PHENOL-ALDEHYDE RESIN COMPOSITIONS AND PROCESS FOR MAKING THE COMPOSITIONS

Walter G. Baumgardt, Tonawanda; John J. Ondesko, North Tonawanda, and Bernard K. Zysman, Snyder, all of N.Y., assignors to Hooker Chemicals & Plastics Corp., Niagara Falls, N.Y.

Filed Dec. 22, 1977, Ser. No. 863,552
Int. Cl.[2] C08K *3/22, 3/36*
U.S. Cl. 260—38 **10 Claims**

1. A phenol-aldehyde resin molding composition capable of forming a nodular or flake product comprising from about 15 to about 60 percent by weight phenol-aldehyde resin, from about 3 to about 20 percent by weight of processed mineral fiber processing aid, and from about 20 to about 70 percent by weight filler material.

4,233,204

AMINE-PROMOTED, PEROXIDE-CURED POLYESTER COMPOSITION

Peter A. Rubel, Concord, Mass., assignor to Rule Industries, Gloucester, Mass.

Filed Jan. 22, 1979, Ser. No. 5,400
Int. Cl.[3] C08K *3/22, 9/04*
U.S. Cl. 260—40 R **18 Claims**

1. In a process for amine-promoting a peroxide cure of a polyester laminating resin composition, the improvement which comprises adding to said composition an effective quantity of amine promoter having a vapor pressure of less than 1 mm mercury at 20° C. while maintaining said amine promoter in intimate contact on a quantity of hydrated filler, said quantity of filler being from 7 to 50 times the weight of said amine promoter.

4,233,205

MODIFIED POLYURETHANE LIQUID POLYMER COMPOSITIONS

James M. O'Connor, Clinton, and Willie J. Sessions, New Haven, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Mar. 26, 1979, Ser. No. 23,870
Int. Cl.[3] C08G *18/32;* **C08K** *3/36*
U.S. Cl. 260—40 TN **26 Claims**

1. A polyurethane liquid polymer composition comprising a urethane oligomer, a polyfunctional mercaptan monomer, a heat activated free radical generating catalyst, and a filler, said urethane oligomer having a final free NCO content from 0 to about 20 percent and being prepared by reacting

(a) an isocyanate-terminated prepolymer having a final free NCO content ranging from about 0.1 to about 30 percent which is the product of reacting

(1) an organic diisocyanate with

(2) an aliphatic polyol having

(i) an average equivalent weight of about 300 to about 4,000,

(ii) an average functionality of about 2 to about 3, and

(iii) said aliphatic polyol is selected from the group consisting of aliphatic polyether polyols, aliphatic polyester polyols and mixtures thereof, with

(b) an isocyanate reactive group-containing unsaturated monomer selected from the group consisting of

(1) unsaturated acrylates and

(2) unsaturated amides.

4,233,206

PROCESS FOR THE PRODUCTION OF COLORED POLYOLEFIN MOLDED ARTICLES AND COLORANTS USED THEREIN

Hiromitsu Katsura; Morihiko Endo, and Takashi Kanno, all of Tokyo, Japan, assignors to Toyo Ink Manufacturing Co., Ltd., Tokyo, Japan

Filed Nov. 6, 1975, Ser. No. 629,267
Claims priority, application Japan, Nov. 20, 1974, 49-132715
Int. Cl.[2] C08K *5/11, 5/12*
U.S. Cl. 260—42.21 **14 Claims**

1. A process for the production of a colored polyolefin molded article comprising adding at least one pigment to a polyolefin to form a mixture and molding the mixture in a mold to produce the colored polyolefin molded article,

characterized by the fact that said pigment comprises a compound represented by the following general formula [I]

$$D\text{-}[CH_2O.OC\text{—}R]_n \qquad [I]$$

wherein D is the residue of an organic pigment, R is a substituted or non-substituted alkyl, alkenyl or aryl group having up to 20 carbon atoms, and n is an integer of from 1 to 4.

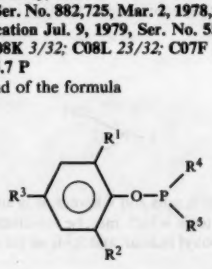
4,233,207

HYDROLYTICALLY STABLE ORTHO-ALKYLATED PHENYL PHOSPHONITES AND STABILIZED COMPOSITIONS

John D. Spivack, Spring Valley, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 882,725, Mar. 2, 1978, abandoned. This application Jul. 9, 1979, Ser. No. 55,665
Int. Cl.[3] C08K *3/32;* **C08L** *23/32;* **C07F** *9/02, 9/48*
U.S. Cl. 260—45.7 P **20 Claims**

1. A compound of the formula



wherein

R^1 is branched alkyl of 3 to 8 carbon atoms, benzyl, α-methylbenzyl or α,α-dimethylbenzyl,

R^2 is alkyl of 1 to 18 carbon atoms, benzyl, α-methylbenzyl or α,α-dimethylbenzyl.

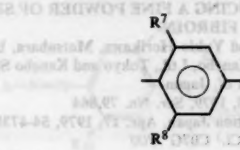
R^3 is hydrogen, alkyl of 1 to 18 carbon atoms, carboalkoxy of 2 to 19 carbon atoms, carboalkoxyalkyl of 3 to 24 carbon atoms, carbophenoxy, carbophenoxyalkyl of 8 to 16 carbon atoms; or said carbophenoxy or said carbophenoxyalkyl with the phenoxy substituted with 1 to 3 alkyl groups with 1 to 8 carbon atoms in each alkyl group,

R^4 is alkyl of 1 to 18 carbon atoms, phenyl or phenyl substituted by 1 to 3 alkyl groups with 1 to 8 carbon atoms in each alkyl group,

R^5 is halogen, —XH or —XR^6,

X is O or S,

R^6 is phenyl, substituted by alkyl, having the formula



R^7 is hydrogen, branched alkyl of 3 to 18 carbon atoms, benzyl, α-methylbenzyl or α,α-dimethylbenzyl,

R^8 is hydrogen, alkyl of 1 to 18 carbon atoms, benzyl, α-methylbenzyl or α,α-dimethylbenzyl, and

R^9 is hydrogen, alkyl of 1 to 18 carbon atoms, carboalkoxy of 2 to 19 carbon atoms, carboalkoxyalkyl of 3 to 24 carbon atoms, carbophenoxy, carbophenoxyalkyl of 8 to 16 carbon atoms; or said carbophenoxy or said carbophenoxyalkyl with the phenoxy substituted with 1 to 3 alkyl groups with 1 to 8 carbon atoms in each alkyl group.

11. A composition of matter comprising an organic polymer subject to oxidative, thermal or actinic degradation stabilized with from 0.01 to 5% by weight of a compound according to claim **1**.

4,233,208

POLYMER COMPOSITIONS STABILIZED WITH HINDERED PHENYL SECONDARY PHOSPHITES

John D. Spivack, Spring Valley, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

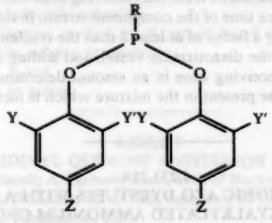
Continuation of Ser. No. 661,585, Feb. 26, 1976, abandoned. This application Jul. 12, 1978, Ser. No. 923,836

Int. Cl.³ C08K *5/51, 5/52*

U.S. Cl. 260—45.8 NT **26 Claims**

1. Compositions comprising a polymer normally subject to deterioration stabilized with

(a) 0.005 to 5% of a stabilizer having the formula



(I)

wherein

R is hydroxy or chlorine,

Y and Y′ are independently alkyl having from 1 to 12 carbon atoms or aralkyl having from 7 to 12 carbon atoms, and

Z is independently hydrogen, halogen, alkyl having from 1 to 12 carbon atoms or aralkyl having from 7 to 12 carbon atoms.

4,233,209

HINDERED PHENOL HYDRAZONES AND COMPOSITIONS STABILIZED THEREWITH

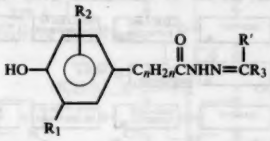
Martin Dexter, Briarcliff Manor, and David H. Steinberg, Bronx, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 839,683, Oct. 5, 1978, abandoned, which is a continuation-in-part of Ser. No. 756,030, Dec. 30, 1976, abandoned. This application Nov. 15, 1978, Ser. No. 960,979

Int. Cl.³ C08K *5/36;* C07C *103/30;* C08K *5/30;* C07C *103/58*

U.S. Cl. 260—45.85 E **16 Claims**

1. A hindered phenol hydrazone of the formula



wherein

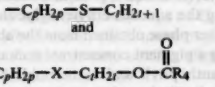
R_1 is hydrogen of a straight or branched chain alkyl of 1 to 8 carbon atoms,

R_2 a straight or branched chain alkyl of 1 to 8 carbon atoms,

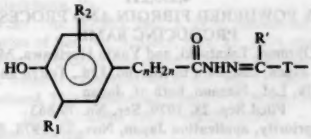
n is an integer of 1 to 5,

R^1 is hydrogen or alkyl of 1 to 8 carbon atoms,

R_3 is an alkyl of 1 to 18 carbon atoms, phenyl or phenyl substituted with 1 to 3 alkyl groups of 1 to 4 carbon atoms, or selected from an interrupted alkyl group of the formulae



where p and t are independently integers of 1 to 18, R_4 is an alkyl group of 1 to 17 carbon atoms or an olefinic group of the formula $-(CH_2)-CH=CH(CH_2)_yCH_3$ where z and y are independently integers of 1 to 12, or R_3 is the group



where T is a direct bond, alkylene of 1 to 6 carbon atoms, phenylene, alkylene interrupted with sulfur or oxygen of the formula $-(C_aH_{2a})-X-(C_aH_{2a})-$ where X is sulfur or oxygen and a is an integer of 1 to 6.

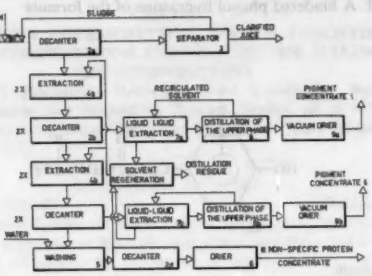
13. A polymer composition comprising a polymer selected from the group consisting of polymonoolefin resins and diene rubbers stabilized against thermal and oxidative degradation by incorporation therein of 0.01 to 5% by weight of a compound of claim **1**.

4,233,210

PROCESS FOR PREPARING NON-SPECIFIC PROTEIN CONCENTRATE AND OF OTHER FODDER ADDITIVES HAVING A BIOLOGICAL ACTIVITY

Lehel Koch, Budapest, Hungary, assignor to Vepex Fövallalkozasi Iroda Rt, Tatabanya, Hungary

Continuation of Ser. No. 786,822, Apr. 12, 1977, abandoned.
This application Dec. 28, 1978, Ser. No. 974,022
Claims priority, application Hungary, Jun. 30, 1976, LI 296
Int. Cl.[3] A23J 1/14
U.S. Cl. 260—112 R 4 Claims



1. A process for preparing a plant protein concentrate which comprises

(a) pressing a green plant material to provide a press cake and pressed juices;

(b) precipitating a protein fraction by heating the pressed juices at about 80° C.;

(c) extracting in a multi-step manner the protein fraction containing 1.5 to 2 times more water than its dry weight twice with at least 5 times more ethyleneglycolether or diethyleneglycolether than its dry weight;

(d) drying the extracted protein fraction after washing it with water to obtain a protein concentrate;

(e) distilling the aqueous ethyleneglycolether or ethylenediglycolether phase obtained from the above extraction, and

(f) isolating a pigment concentrate containing lipids, chlorophyll, xanthophyll and carotenoids by mixing a residue from the distillation of step (e) with the press cake of step (a).

4,233,211

FINELY POWDERED FIBROIN AND PROCESS FOR PRODUCING SAME

Koichiro Ohtomo, Takatsuki, and Yukio Horikawa, Matsubara, both of Japan, assignors to Kanebo, Ltd., Tokyo and Kanebo Spun Silk, Ltd., Nagano, both of, Japan

Filed Sep. 28, 1979, Ser. No. 79,863
Claims priority, application Japan, Nov. 13, 1978, 53-139973
Int. Cl.[3] C07G 7/00; A23J 1/10
U.S. Cl. 260—123.7 12 Claims

1. A fine powder of regenerated fibroin in nonfibrous and particulate form which has an average molecular weight of not less than 50,000, a degree of molecular orientation equal to not greater than one-half that of natural silk thread, particle diameters of from 1 to 100μ, and a bulk density of from 0.1 to 0.7 g/cm^3 as measured in the dry state and which contains at least 50% by weight of hot-water-insoluble fibroin having the β-configuration.

4,233,212

PROCESS FOR PRODUCING A FINE POWDER OF SILK FIBROIN

Kiyoshi Otoi, Maruko, and Yukio Horikawa, Matsubara, both of Japan, assignors to Kanebo, Ltd., Tokyo and Kanebo Spun Silk, Ltd., Nagano, both of, Japan

Filed Sep. 28, 1979, Ser. No. 79,864
Claims priority, application Japan, Apr. 17, 1979, 54-47382
Int. Cl.[3] C07G 7/00
U.S. Cl. 260—123.7 11 Claims

1. A process for producing a fine powder of silk fibroin in nonfibrous and particulate form which has an average molecular weight of not less than 50,000, a degree of molecular orientation equal to not greater than one-half that of natural silk thread, particle diameters of from 1 to 100μ, and a bulk density of from 0.1 to 0.7 g/cm^3 as measured in the dry state and which contains at least 50% by weight of hot-water-insoluble fibroin having the β-configuration, the process comprising the steps of dissolving a degummed silk material in at least one solvent selected from the group consisting of an aqueous cuprietheylenediamine solution, an aqueous ammoniacal solution of cupric hydroxide, an aqueous alkaline solution of cupric hydroxide and glycerol, an aqueous lithium bromide solution, an aqueous solution of the chloride, nitrate or thiocyanate of calcium, magnesium or zinc, and an aqueous sodium thiocyanate solution; adding a coagulating salt to the resulting aqueous silk fibroin solution having a silk fibroin concentration of from 3 to 20% by weight to coagulate and precipitate the silk fibroin; dehydrating and drying the gel so formed; and then pulverizing the resulting powder.

4,233,213

PROCESS FOR THE CONTINUOUS INDIRECT DIAZOTIZATION OF AROMATIC AMINES

Kurt Breig; Georg Dehmel, both of Cologne, and Norbert Hamm, Bergisch-Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 1, 1978, Ser. No. 939,153
Claims priority, application Fed. Rep. of Germany, Sep. 17, 1977, 2741925
Int. Cl.[3] C07C 113/00
U.S. Cl. 260—141 7 Claims

1. A process for the continuous indirect diazotization of an aromatic amine which comprises mixing an aromatic amine with water and an excess of nitrite in a receiving zone in which no diazotization occurs, primarily feeding the mixture from the receiving zone to a diazotization vessel thereafter reacting the resulting mixture in the diazotization vessel with a mineral acid, withdrawing a component stream of the mixture of amine, water and nitrite from the receiving zone into an analyser, the residence time of the component stream in the analyser being shorter by a factor of at least 3 than the residence time of the mixture in the diazotization vessel, and adding additional nitrite to the receiving zone in an amount determined by the amount of amine present in the mixture which is monitored in the analyser.

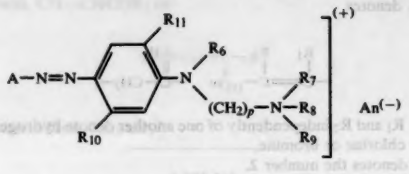
4,233,214

CATIONIC AZO DYESTUFFS WITH A HYDROXYALKYLATED AMMONIUM GROUP

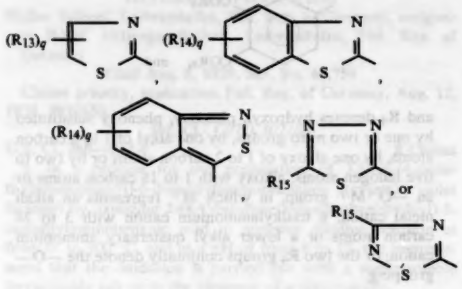
Günther Boehmke, Opladen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 445,833, Feb. 26, 1974, Pat. No. 4,036,826.
This application Jun. 30, 1976, Ser. No. 701,420
Claims priority, application Fed. Rep. of Germany, Feb. 26, 1973, 2309528
Int. Cl.[3] C07C 107/04; C09B 44/02
U.S. Cl. 260—158 2 Claims

1. Cationic azo dyestuff of the formula



wherein A is



in which

R_{13} is C_1–C_5-alkyl, phenyl, cyano, nitro or carbomethoxy,

R_{14} is C_1–C_5-alkyl, C_1–C_4-alkoxy, phenoxy, nitro, carbomethoxy, chloro, or bromo;

R_{15} is hydrogen; C_1–C_5-alkyl; C_1–C_4-alkoxy; phenoxy; cyclohexyl; phenyl; phenyl substituted by methyl, ethyl, methoxy, ethoxy, nitro, chlorine or acetylamino; benzyl; methylmercapto; ethylmercapto; phenylmercapto; benzylmercapto; dimethylamino; diethylamino; methylsulphonyl; ethylsulphonyl; or phenylsulphonyl; and

q is 0, 1 or 2;

and wherein

R_6 is methyl, ethyl, propyl or butyl;

R_7 is methyl, ethyl, propyl or butyl;

R_8 is methyl, ethyl, propyl or butyl;

R_9 is 2-hydroxypropyl, 2-hydroxybutyl, 2-hydroxyethylphenyl, 2-hydroxy-3-methoxy-propyl, 2-hydroxy-3-chloropropyl, 2-hydroxy-3-ethoxy-propyl, 2-hydroxy-3-propoxy-propyl, 2-hydroxy-3-allyloxy-propyl, 2-hydroxy-3-butoxy-propyl, 2-hydroxy-3-phenoxy-propyl or 2-hydroxy-3-benzoyl-propyl;

R_{10} is hydrogen; methyl; ethyl; propyl; butyl; chloro; bromo; methoxy; ethoxy; propoxy; acetylamino; propionylamino; or methylsulphonylamino;

R_{11} is hydrogen, methyl, ethyl, propyl, butyl, chloro, bromo, methoxy, ethoxy or propoxy;

p is 2 or 3; and

$An^{(-)}$ is an anion.

4,233,215

AZIRIDINYL QUINONE ANTITUMOR AGENTS

John S. Driscoll; A. Hameed Khan, both of Rockville, and Feng-Te Chou, Bethesda, all of Md., assignors to United States of America, Washington, D.C.

Division of Ser. No. 758,812, Jan. 12, 1977, Pat. No. 4,146,622. This application Oct. 24, 1978, Ser. No. 954,218

Int. Cl.[2] C07D *295/12*

U.S. Cl. 260—239 EQ **11 Claims**

1. 2,5-di(2-methylaziridinyl)-3,6-bis(methylamino)-1,4-benzoquinone.

2. 2,5-diaziridinyl-3,6-diamino-1,4-benzoquinone.

3. 2,5-diaziridinyl-3,6-bis(methylamino)-1,4-benzoquinone.

4. 2,5-diaziridinyl-3,6-bis(ethylamino)-1,4-benzoquinone.

5. 2,5-diaziridinyl-3,6-bis(propylamino)-1,4-benzoquinone.

4,233,216

AZETIDINONE DERIVATIVES AND PRODUCTION THEREOF

Shoichiro Uyeo; Mitsuru Yoshioka; Teruji Tsuji, all of Osaka; Ikuo Kikkawa, and Wataru Nagata, both of Hyogo, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

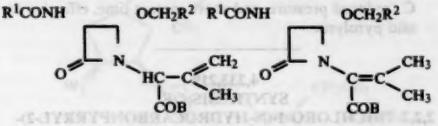
Continuation-in-part of Ser. No. 875,907, Feb. 7, 1978, abandoned. This application Dec. 6, 1978, Ser. No. 967,007

Claims priority, application Japan, Feb. 8, 1977, 52/13452

Int. Cl.[2] C07D *205/08, 403/12, 417/12, 409/12*

U.S. Cl. 260—239 A **12 Claims**

1. A compound of the formula:



wherein

R^1 is C_{1-5} alkyl, phenoxy-C_{1-3} alkyl, phenyl-C_{1-3}- alkyl, phenyl, tolyl, methoxyphenyl, chlorophenyl, nitrophenyl, hydroxyphenyl, acetoxyphenyl, acetamidophenyl, thienyl or furyl;

R^2 is ethynyl, 2-bromoethynyl, acetoxyacetyl, (1-methyl-tetrazol-5-yl)thioacetyl, (2-methyl-1,3,4-thiadiazol-5-yl)thioacetyl, 1-methylene-2-acetoxyethyl, 1-methylene-2-(1-methyltetrazol-5-yl) thioethyl, 1-methylene-2-(2-methyl-1,3,4-thiadiazol-5-yl)-thioethyl or 1-methoxycarbonyl-methylene-2-(1-methyl-tetrazol-5-yl) thioethyl;

and B is hydroxy, C_{1-4} alkoxy, phenyl-C_{1-3} alkoxy, diphenyl-C_{1-3} alkoxy, phenoxy, indanyloxy, naphthoxy, tri-C_{1-3} alkylsilyloxy, C_{1-3} alkoxy di-C_{1-3} alkylsilyloxy, tri-C_{1-3} alkylstannyloxy, di-C_{1-3} alkylhydrazino, alkali metal oxy, magnesium oxy, calcium oxy, aluminum oxy, tri-C_{1-3} alkylammonium oxy or bicyclohexylammonium oxy.

4,233,217

SUBSTITUTED 1,2,4,5-TETRAHYDRO-3H, 3 BENZAZEPINES

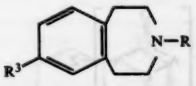
Bola V. Shetty, Rockville, Md., assignor to Pennwalt Corporation, Philadelphia, Pa.

Division of Ser. No. 747,151, Dec. 3, 1976, abandoned, which is a continuation of Ser. No. 523,092, Nov. 12, 1974, abandoned, which is a continuation-in-part of Ser. No. 241,091, Apr. 4, 1972, abandoned, which is a continuation of Ser. No. 711,897, Mar. 11, 1968, abandoned. This application May 21, 1979, Ser. No. 41,575

Int. Cl.[3] A61K *31/55*; C07D *223/16*

U.S. Cl. 260—239 BB **2 Claims**

1. A compound of the formula



wherein R is cycloalkylmethyl of 4 to 6 carbons and R^3 is hydroxy or methoxy.

4,233,218
PYROLYSIS OF N-SUBSTITUTED-1-CYCLOHEXENE-1,2-DICARBOXIMIDES

Raymond L. Cobb, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 935,201, Aug. 21, 1978, Pat. No. 4,193,924, which is a division of Ser. No. 802,168, May 31, 1977, Pat. No. 4,125,536, which is a division of Ser. No. 603,221, Aug. 8, 1975, Pat. No. 4,056,542, which is a division of Ser. No. 360,962, May 16, 1973, Pat. No. 3,932,457. This application Sep. 18, 1979, Ser. No. 76,708

Int. Cl.[3] C07D *487/04, 487/10*

U.S. Cl. 260—326 C 3 Claims

1. The process for preparing N,N'-dialkyl or diphenylpyromellitdiimides and the dimers of N-alkyl or phenyl-1,3-butadiene-2,3-dicarboximides, which comprises pyrolyzing N-phenyl- or N-alkyl-1-cyclohexene-1,2-dicarboximides under pyrolysis conversion conditions,

wherein said pyrolysis conversion conditions include elevated temperatures in the range of about 500° C. to 1000° C., reduced pressure, and short contact time, effective for said pyrolysis.

4,233,219
SYNTHESIS OF 2,2,2-TRICHLORO-1-(N-HYDROCARBONPYRRYL-2)-ETHANOL

Michael J. Dagani, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Apr. 9, 1979, Ser. No. 28,317

Int. Cl.[3] C07D *207/30*

U.S. Cl. 260—326.5 R 14 Claims

1. In a process of preparing 2,2,2-trichloro-1-(N-hydrocarbonpyrryl-2)-ethanol by mixing and reacting essentially equimolar quantities of chloral and N-hydrocarbonpyrrole in a liquid reaction system containing a protonic acid added in the form of an organic acid, the improvement pursuant to which

(a) the reaction is performed in a methylene chloride reaction medium containing protonic acid added in the form of a carboxylic acid whose acidic dissociation constant is below about 6.3×10^{-5} (at 25° C.) and

(b) the relative amounts of the chloral, N-hydrocarbonpyrrole and methylene chloride reaction medium are proportioned so as to result in the formation of a solution of 2,2,2-trichloro-1-(N-hydrocarbonpyrryl-2)-ethanol in the reaction medium having to concentration in the range of about 1 to about 8 molar.

4,233,220
IMIDYL-BENZENE-DICARBOXYLIC AND -TRICARBOXYLIC ACID DERIVATIVES

Vratislav Kvita, Muttenz; Roland Darms, Therwil, and Gerd Greber, Binningen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

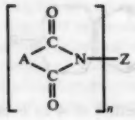
Division of Ser. No. 696,348, Jun. 15, 1976, Pat. No. 4,132,716. This application Oct. 16, 1978, Ser. No. 951,432

Claims priority, application Switzerland, Jun. 18, 1975, 7953/75

Int. Cl.[3] C07D *403/02, 405/02*

U.S. Cl. 260—326.26 4 Claims

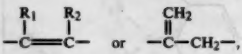
1. An imidyl-benzenedicarboxylic acid compound of the formula I



(I)

wherein

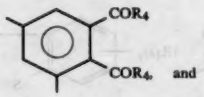
A denotes



R_1 and R_2 independently of one another denote hydrogen, chlorine or bromine,

n denotes the number 2,

Z denotes the formula



and

and R_4 denotes hydroxyl, phenoxy, phenoxy substituted by one or two nitro groups, by one alkyl of 1 to 2 carbon atoms, by one alkoxy of 1 to 2 carbon atoms or by two to five halogen atoms; alkoxy with 1 to 18 carbon atoms or an $-O^-M^+$ group, in which M^+ represents an alkali metal cation, a trialkylammonium cation with 3 to 24 carbon atoms or a lower alkyl quaternary ammonium cation; or the two R_4 groups conjointly denote the —O— grouping.

4,233,221
ETHYLENE CARBONATE PROCESS

Dale A. Raines, Wheatridge, Colo., and Oliver C. Ainsworth, Baton Rouge, La., assignors to The Dow Chemical Company, Midland, Mich.

Filed Oct. 24, 1979, Ser. No. 87,841

Int. Cl.[3] C07D *317/38*

U.S. Cl. 260—340.2 7 Claims

1. An integrated process for making ethylene carbonate by (1) reacting ethylene with oxygen over a silver catalyst to produce ethylene oxide, (2) contacting the product gases from said reaction with ethylene carbonate to absorb ethylene oxide and carbon dioxide, (3) stripping said ethylene oxide and carbon dioxide from the said ethylene carbonate absorbent by contacting with an inert gas, (4) reacting said ethylene oxide and carbon dioxide over an anion exchange resin to form ethylene carbonate and (5) recovering said ethylene carbonate.

4,233,222
CYCLOPENTYLACETIC ACID DERIVATIVES

Hiromi Shimomura, Nishinomiya; Akihiko Sugie, Takarazuka, and Junki Katsube, Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

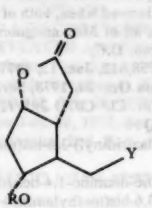
Division of Ser. No. 911,039, May 30, 1978. This application May 15, 1979, Ser. No. 39,215

Claims priority, application Japan, May 31, 1977, 52-64217; Sep. 6, 1977, 52-107642

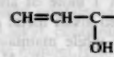
Int. Cl.[3] C07D *307/93*

U.S. Cl. 260—343.3 P 1 Claim

1. A compound of the formula



wherein R is hydrogen or hydroxy-protecting group and Y is formyl, CH=CHCOR$_2$ or



(wherein R$_2$ is C$_{4-8}$ alkyl).

4,233,223

PREPARATION OF 3,3-BIS-(4-DIMETHYLAMINOPHENYL)-6-DIMETHYLAMINOPHTHALIDE

Walter Seibert, Ludwigshafen, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Aug. 8, 1979, Ser. No. 64,759

Claims priority, application Fed. Rep. of Germany, Aug. 12, 1978, 2835450

Int. Cl.^{2} C07D *307/88*

U.S. Cl. 260—343.4 **8 Claims**

1. In a process for the preparation of 3,3-bis-(4-dimethylaminophenyl)-6-dimethylaminophthalide (crystal violet lactone) by oxidizing 2-(4,4'-bis-dimethylaminobenzhydryl)-5-dimethylaminobenzoic acid in aqueous alkaline solution at from 0° to 100° C. and at a pH of from 8 to 12, the improvement that the oxidation is carried out with a water-soluble ferricyanide salt or in the presence of a ferricyanide.

4,233,224

CORIOLIN DERIVATIVES

Yuya Nakayama, Omiya; Mamoru Kunishima, Tikorozawa; Akira Matsuda, Omiya, and Tomio Takeuchi, Tokyo, all of Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

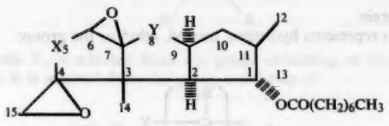
Filed May 23, 1979, Ser. No. 41,904

Claims priority, application Japan, May 29, 1978, 53-63321

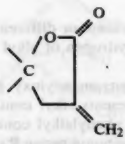
Int. Cl.^{3} C07D *493/20, 493/22*

U.S. Cl. 260—343.6 **6 Claims**

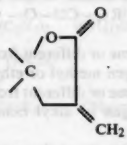
1. A coriolin derivative represented by the general formula:



wherein one of X and Y is



and the other is >C OH, >C=O or



4,233,225

2-DECARBOXY-2-HYDROXYMETHYL-9-DEOXY-6,9α-EPOXYMETHANO-5,6-DIDEHYDRO-PGF$_1$ COMPOUNDS

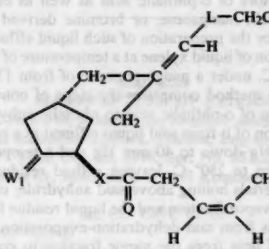
Robert C. Kelly, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 935,392, Aug. 21, 1978, which is a division of Ser. No. 819,941, Jul. 28, 1977, Pat. No. 4,124,599, which is a continuation-in-part of Ser. No. 725,547, Sep. 22, 1976, abandoned, which is a continuation-in-part of Ser. No. 716,771, Aug. 23, 1976, abandoned. This application Aug. 16, 1979, Ser. No. 67,494

Int. Cl.^{3} C07D *311/02*

U.S. Cl. 260—345.2 **13 Claims**

1. A 5E compound of the formula



wherein W$_1$ is α—OH:β—H, α—H:β—OH, oxo, methylene, α—H:β—H, α—CH$_2$OH:β—H;

wherein L is

(1) —(CH$_2$)$_d$—C(R$_2$)$_2$,

(2) —CH$_2$—O—CH$_2$—Y—, or

(3) —CH$_2$CH=CH—,

wherein d is zero to 5, R$_2$ is hydrogen, methyl, or fluoro, being the same or different with the proviso that one R$_2$ is not methyl when the other is fluoro, and Y is a valence bond, —CH$_2$— or —(CH$_2$)$_2$—,

wherein Q is oxo, α—H:β—H, α—OH:β—R$_8$ or α—R$_8$.:β—OH

wherein R$_8$ is hydrogen or alkyl of one to 4 carbon atoms, inclusive; and

wherein X is

(1) trans—CH=CH—,

(2) cis—CH=CH—,

(3) —C≡C—, or

(4)—CH$_2$CH$_2$—;

including the lower alkanoates thereof.

4,233,226

NOVEL HEXAHYDROBENZOPYRAN DERIVATIVE AND METHOD OF PREPARING THE SAME

Makoto Takeda; Hiroshi Iwane, both of Ami, and Takashi Hashimoto, Tokyo, all of Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

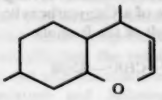
Filed Aug. 24, 1979, Ser. No. 69,407

Claims priority, application Japan, Aug. 24, 1978, 53-103322

Int. Cl.^{3} C07D *311/74;* C11B *9/00*

U.S. Cl. 260—345.2 **1 Claim**

1. 4a,5,6,7,8,8a-hexahydro-4,7-dimethyl-4H-1-benzopyran of the formula:



4,233,227
PHTHALIC ANHYDRIDE FORMATION AND SEPARATION

Hobe Schroeder, Warrenville, and David A. Palmer, Naperville, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Continuation-in-part of Ser. No. 22,431, Mar. 2, 1979, abandoned. This application Oct. 5, 1979, Ser. No. 82,069

Int. Cl.³ C07D *307/89*

U.S. Cl. 260—346.7 **4 Claims**

1. A method for obtaining a partially purified phthalic anhydride product from the liquid effluent containing from 70 up to 92% o-phthalic acid, from 1.5 up to 21% water, from 0.3 up to 13% benzoic acid and/or acetic acid by weight and impurities boiling above and below the boiling point of phthalic anhydride which are oxygen containing aromatic compounds including precursors of o-phthalic acid as well as compounds containing cobalt, manganese; or bromine derived from the catalysis used for the preparation of such liquid effluent by the neat air oxidation of liquid xylene at a temperature of from 150° C. up to 230° C. under a gauge pressure of from 17 up to 30 kg/cm^2; which method comprises the steps of continuous in situ dehydration of o-phthalic acid to phthalic anhydride and flash evaporation of it from said liquid effluent at a pressure of from 760 mm Hg down to 40 mm Hg and a temperature of from 180° C. up to 250° C. leaving a fluid residue fraction containing materials boiling above said anhydride; continuous removal of the vapor fraction and the liquid residue fraction as separate streams from said dehydration-evaporation; continuous removal of heat from the vapor fraction to cool it to a temperature below the boiling temperature of phthalic anhydride but above the dew point of water whereat partially purified phthalic anhydride condenses to the liquid state, and the continuous separation of uncondensed vapors from the liquid partially purified phthalic anhydride condensate.

4,233,228
PURIFICATION OF TETRAHYDROFURAN

Herbert Mueller, Frankenthal, and Otto H. Huchler, Limburgerhof, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 19, 1978, Ser. No. 952,805

Claims priority, application Fed. Rep. of Germany, Oct. 31, 1977, 2748788

Int. Cl.³ C07D *307/08*

U.S. Cl. 260—346.11 **4 Claims**

1. A process for purifying tetrahydrofuran which comprises: intimately mixing the tetrahydrofuran to be treated at from room temperature to the boiling point of the tetrahydrofuran with a bleaching earth containing less than 3% by weight of water for from 3 minutes to 12 hours, and thereafter separating the bleaching earth from the tetrahydrofuran, whereby the carbonyl number, the bromine number and the peroxide content of the tetrahydrofuran are reduced.

4,233,229
PREPARATION OF SALT-FREE N-ACYL TAURINES

Paritosh M. Chakrabarti, Wayne, N.J., assignor to GAF Corporation, New York, N.Y.

Filed Jan. 3, 1978, Ser. No. 866,284

Int. Cl.² C07C *143/90*

U.S. Cl. 260—401 **11 Claims**

1. A process for preparing an N-acyl taurine substantially free of alkali metal chloride comprising reacting, in a C_{1-4} alkanol medium initially containing no more than about 15% by weight of water, at temperatures ranging from about 30° C. up to reflux, 1 mole of a C_{6-22}carboxylic acid chloride with 1 mole of a taurine salt of the formula

$$HNR^1—CHR^2—CHR^2—SO_3M$$

wherein

R^1 is H or a C_{1-6}hydrocarbon radical,

R^2 is independently H, methyl or ethyl, and

M is alkali metal,

in the presence of about 1 mole of alkali metal hydroxide, separating the precipitated alkali metal chloride from the alkanolic reaction mixture while maintaining the temperature thereof high enough to solubilize the N-acyl taurine reaction product, and then cooling the reaction medium low enough to precipitate the desired N-acyl taurine.

4,233,230
PROCESS FOR PREPARING OLEFINS BY METATHESIS OF CYCLIC OLEFINS WITH ACYCLIC OLEFINS

Jean Otton, Ecully, France, assignor to Rhone-Poulenc Industries, Paris, France

Filed May 4, 1978, Ser. No. 902,709

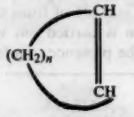
Claims priority, application France, May 6, 1977, 77 13804; Apr. 24, 1978, 78 11986

Int. Cl.³ C07C *67/343*

U.S. Cl. 260—410.9 R **22 Claims**

1. A process for preparing olefins which comprises, successively, the steps of:

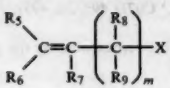
(a) first introducing into a reactor (i) a cyclic olefin of formula I:



(I)

wherein

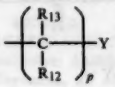
n represents a whole number from 2 to 12, and an acyclic olefin in an amount sufficient to achieve a molar ratio of cyclic to acyclic olefins of from about 0.5 to about 2.0, said acyclic olefin being of formula II:



(II)

wherein

R_5 represents hydrogen, methyl, ethyl or the group:



wherein

R_{12} and R_{13} are the same or different from each other and each represents hydrogen or alkyl containing 1 to 5 carbon atoms;

Y represents halogen; an acyloxy group R_{14}—CO—O— wherein R_{14} represents alkyl containing 1 to 12 carbon atoms, phenyl or phenylalkyl containing 7 to 12 carbon atoms, or an oxycarbonyl group R_{15}—O—CO—, wherein R_{15} represents alkyl containing 1 to 12 carbon atoms, phenyl or phenylalkyl containing 7 to 12 carbon atoms;

p represents a whole number from 1 to 12 except when Y is an acyloxy group R_{14}—CO—O— wherein P is from 2 to 12;

R_6 and R_7 are the same or different from each other and each represents hydrogen methyl or ethyl;

R_8 and R_9 are the same or different from each other and each represents hydrogen or alkyl containing 1 to 5 carbon atoms;

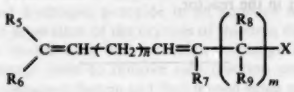
X represents halogen; an acyloxy group R_{10}—CO—O—

wherein R_{10} represents alkyl containing 1 to 12 carbon atoms, phenyl or phenyl alkyl, containing 7 to 12 carbon atoms; or an oxycarbonyl group R_{11}—O—CO, wherein R_{11} represents alkyl containing 1 to 12 carbon atoms, phenyl or phenyl alkyl, containing 7 to 12 carbon atoms; m represents a whole number from 1 to 12 except when X is an acyloxy group R_{10}—CO—O wherein m is from 2 to 12, and optionally (ii) a suitable solvent;

(b) then introducing into the reactor (i) a solution or suspension of a tungsten oxide salt wherein all or part of the oxygen atoms are replaced by halogen when the solvent is omitted from step (a), and (ii) said tungsten oxide salt being optionally in solid form when a solvent is present in step (a);

(c) after the reaction mixture from step (b) has become a homogeneous solution, adding thereto an organic-tin compound reducing agent and reacting said cyclic and acyclic olefins at a suitable temperature between about −20 and about 300° C.; and

(d) recovering a compound of formula III:



wherein R_5, R_6, R_7, R_8, R_9, n, m, and X are as defined above.

4,233,231

NOVEL VINYL-STANNYL DERIVATIVES

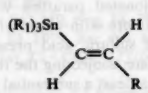
Middleton B. Floyd, Jr., Suffern; Charles V. Grudzinskas, Nyack, both of N.Y., and Sow-Mei L. Chen, Park Ridge, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Nov. 22, 1977, Ser. No. 853,941

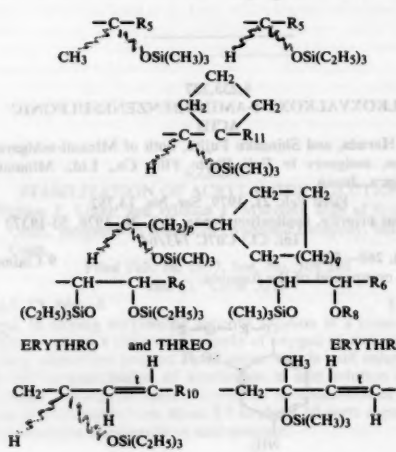
Int. Cl.³ C07F 7/22

U.S. Cl. 260—429.7 **21 Claims**

1. A compound of the formula:



wherein R_1 is selected from the group consisting of C_1–C_5 alkyl; R is selected from the group consisting of



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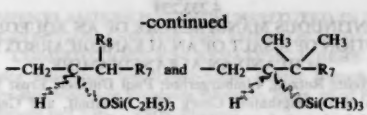


wherein R_5 is selected from the group consisting of C_4–C_7 alkyl, R_6 is selected from the group consisting of C_5–C_6 alkyl R_7 is selected from the group consisting of C_2–C_5 alkyl, R_8 is methyl or ethyl, R_{10} is selected from the group consisting of C_1–C_4 alkyl, R_{11} is selected from the group consisting of C_3–C_6 alkyl, benzyl, 2-butyne and 2-butene, n is the integer 1 or 2, p is the integer 1 or 2, and q is the integer 1 or 2.

4,233,232

MANUFACTURE OF ESTERS

Michael S. Howarth, Manchester, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Oct. 13, 1978, Ser. No. 951,260

Claims priority, application United Kingdom, Nov. 28, 1977, 49349/77

Int. Cl.³ C07C 67/02

U.S. Cl. 260—465 D **7 Claims**

1. A process for the preparation of esters of m-phenoxybenzyl alcohol and its α-cyano and α-ethinyl derivatives with carboxylic acids which comprise mixing a methyl or ethyl ester of the carboxylic acid, m-phenoxybenzyl alcohol or its α-cyano or α-ethinyl derivative and a tetra-aryl titanate as catalyst, and heating the mixture at a temperature such that the methanol or ethanol are removed by distillation as it is formed, wherein said carboxylic acid is selected from the group consisting of

2,2-dimethyl-3-(2',2'-dimethylvinyl) cyclopropanecarboxylic acid;

2,2-dimethyl-3-(2',2'-dichlorovinyl) cyclopropanecarboxylic acid;

2,2-dimethyl-3-(2'-ethylvinyl) cyclopropanecarboxylic acid;

2,2-dimethyl-3-(2',2'-dibromovinyl) cyclopropanecarboxylic acid;

2,2-dimethyl-3-(2'-chloro-2'-trifluoromethylvinyl) cyclopropanecarboxylic acid; and

2,2-dimethyl-3-(2',2'-bis(trifluoromethyl)vinyl) cyclopropanecarboxylic acid.

4,233,233

PROCESS FOR THE PREPARATION OF 2-OXOIMINOPHENYLACETONITRILE

Horst Schröer, Prairie Village, Kans.; Karl Goliasch, Berg. Gladbach, and Uwe Beck, Cologne, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 3, 1979, Ser. No. 35,755

Claims priority, application Fed. Rep. of Germany, Jun. 10, 1978, 2825565

Int. Cl.³ C07C 121/78

U.S. Cl. 260—465 E **11 Claims**

1. In the preparation of 2-oximinophenylacetonitrile by reacting benzyl cyanide with an alkyl nitrite in the presence of a base, the improvement which comprises employing an inorganic base as the base, effecting the reaction in an aqueous solution of an alcohol, and after the reaction has ended acidifying the reaction mixture and isolating the 2-oximinophenylacetonitrile therefrom.

4,233,234
CONTINUOUS MANUFACTURE OF AN AQUEOUS SOLUTION OF A SALT OF AN ALKANEDICARBOXYLIC ACID AND AN ALKANEDIAMINE

Rudi-Heinz Rotzoll, Limburgerhof; Paul Duffner; Ernst Dietl, both of Ludwigshafen; Georg Pilz, Neustadt, and Gerhard Thiel, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 12, 1978, Ser. No. 914,925

Claims priority, application Fed. Rep. of Germany, Jun. 27, 1977, 2728818

Int. Cl.³ C07C *87/14*

U.S. Cl. 260—501.2 **8 Claims**

1. A continuous process for preparing an aqueous solution of a salt of an alkanedicarboxylic acid having 6 to 12 carbon atoms and an alkanediamine having 6 to 12 carbon atoms which comprises reacting the particular alkanedicarboxylic acid with the particular alkanediamine in an aqueous solution of the salt to be prepared by (1) recycling an aqueous solution of said salt from a first mixing zone through a transport zone and then a second mixing zone back to said first mixing zone, the amount of salt solution circulated per hour being from 40 to 80 times the amount contained in said first mixing zone, (2) introducing an aqueous solution of said alkanedicarboxylic acid and less than the equivalent amount of said alkanediamine in liquid form into said recycling salt solution at a location between said first and second mixing zones, (3) introducing an additional amount of said alkanediamine in liquid form into said recycling salt solution at a location after said second mixing zone, the amount of alkanedicarboxylic acid and the total amount of alkanediamine introduced being approximately equivalent, (4) maintaining the aqueous solution at a temperature in the range of 90° C. to 102° C., and (5) removing aqueous salt solution from the first mixing zone at a rate corresponding to the rate at which it is formed.

4,233,235
METHOD FOR MAKING DIPEROXYACIDS

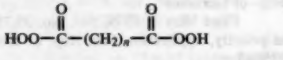
James B. Camden, Germantown, Tenn., and Mark L. McCarty, Loveland, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 895,411, Apr. 11, 1978, abandoned, which is a continuation-in-part of Ser. No. 829,310, Mar. 31, 1977, abandoned. This application Feb. 26, 1979, Ser. No. 15,393

Int. Cl.³ C07C *179/10, 179/15*

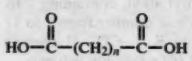
U.S. Cl. 260—502 R **10 Claims**

1. A continuous process for making diperoxyacids of the formula



wherein n is from about 6 to about 14, said diperoxyacids having a crystalline form and an average crystal size substantially greater than about 19 microns, comprising:

(a) continuously adding to a stirred reactor of temperature from about 15° C. to about 45° C. the following materials:
(1) hydrogen peroxide;
(2) water;
(3) sulfuric acid; and
(4) a dibasic acid of the formula



wherein n is from about 6 to about 14;

(b) continuously withdrawing from the reactor diperoxyacid product formed as a result of the oxidation of the dibasic acid;

(c) filtering the diperoxyacid product; and

(d) washing the diperoxyacid product with water and drying it;

wherein the inlet flow rates to the reactor of sulfuric acid, hydrogen peroxide and water are sufficient to maintain a liquid concentration of about 60% to about 80% sulfuric acid, about 0.5% to about 15% hydrogen peroxide, and about 5% to about 39.5% water in the reactor.

4,233,236
SEPARATION OF SULPHONIC ACIDS FROM THE MEDIUM IN WHICH THEY ARE PREPARED

Rene Kern, Savigny-sur-Orge, and Daniel Augustin, Massy, both of France, assignors to ATO Chimie, Paris, France

Filed Dec. 26, 1978, Ser. No. 972,726

Claims priority, application France, Dec. 28, 1977, 77 39485

Int. Cl.³ C07C *139/00, 143/24*

U.S. Cl. 260—504 S **12 Claims**

1. Process for the separation of sulfonated paraffins from the aqueous reaction mixture in which they are produced by sulfonation of paraffins, said reaction mixture containing sulfuric acid, unsulfonated paraffins and a hydrocarbon solvent for said sulfonated and unsulfonated paraffins which is capable of forming azeotropic mixture with water which comprises: partially neutralizing the sulfuric acid present in the reaction mixture to form bisulfate; subjecting the reacting mixture to a distillation to remove at least a substantial part of the water in the form of azeotropic mixture with the hydrocarbon; allowing the remaining material to separate into two layers, and separating the bottom layer, which contains bisulfate, from the upper sulfonic acid containing layer.

4,233,237
2-ALKOXYALKOXY-5-AMINOBENZENESULFONIC ACID

Tooru Harada, and Shinsaku Fujita, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

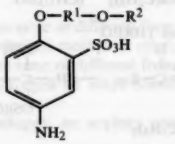
Filed Feb. 21, 1979, Ser. No. 13,752

Claims priority, application Japan, Feb. 20, 1978, 53-18373

Int. Cl.³ C07C *143/64*

U.S. Cl. 260—509 **9 Claims**

1. A compound of the formula:



(I)

wherein R^1 represents an alkylene group having 2 or more carbon atoms and R^2 represents an alkyl group provided that the two oxygen atoms in the —O—R^1—O—R^2 moiety are not connected to the same carbon atom in R^1.

4,233,238

PROCESS FOR PREPARING THIOUREA DIOXIDE

Osami Ohura, and Osamu Fujimoto, both of Fuji, Japan, assignors to Tokai Denka Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 9, 1979, Ser. No. 55,788
Claims priority, application Japan, Jul. 25, 1978, 53-89984
Int. Cl.[3] C07C *145/00*
U.S. Cl. 260—513.7 7 Claims

1. A process for preparing thiourea dioxide characterized in that in the production of thiourea dioxide by the reaction of thiourea and hydrogen peroxide in an aqueous solvent, the filtrate after separation of the crystals of thiourea dioxide after reaction is treated with both an anion exchange resin and a cation-exchange resin to remove side reaction products and impurities contained therein and then is used again as a reaction solvent in said process.

4,233,239

UREADIACETOACETAMIDO COMPOUNDS

John S. Heckles, Lancaster, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.

Division of Ser. No. 942,189, Sep. 14, 1978. This application Aug. 13, 1979, Ser. No. 65,857
Int. Cl.[3] C07C *127/00*
U.S. Cl. 564—57 6 Claims

1. bis 1,3(1-acetoacetamide-2,2,4-trimethylhexamethylene-6-ureylene)3-methylene-3,5,5-trimethylcyclohexylene.

4,233,240

STABILIZATION OF ACRYLAMIDE SOLUTIONS

William F. Linke, and William F. Marzluff, both of Stamford, Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Feb. 14, 1977, Ser. No. 768,248
Int. Cl.[3] C08K *3/10*
U.S. Cl. 564—4 1 Claim

1. In storing acrylamide aqueous solution in a closed container without a continuous supply of oxygen to said solution, using cupric ion present as a copper salt in said solution to inhibit polymerization of acrylamide in said solution during storage, the improvement wherein the concentration of cupric ion is in the range from about 0.5 to about 10 parts copper per million parts acrylamide in said solution.

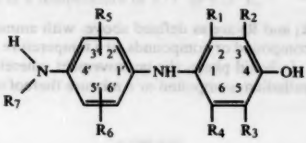
4,233,241

DIPHENYLAMINES N-MONOSUBSTITUTED IN THE 4'-POSITION AND THE USE THEREOF IN DYE COMPOSITIONS FOR KERATINIC FIBERS

Gregoire Kaiopissis, Neuilly-sur-Seine; Andree Bugaut, Boulogne-sur-Seine, and Francoise Estradier, Paris, all of France, assignors to L'Oré Paris, France

Continuation of Ser. No. 884,817, Mar. 9, 1978, abandoned, which is a continuation of Ser. No. 743,497, Nov. 19, 1976, abandoned, which is a division of Ser. No. 551,627, Feb. 21, 1975, Pat. No. 4,008,043. This application Apr. 19, 1979, Ser. No. 31,634
Claims priority, application Luxembourg, Feb. 22, 1974, 69457
Int. Cl.[3] C07C *103/375*
U.S. Cl. 564—221 3 Claims

1. Diphenylamine of the formula:



wherein

R_1 and R_4 each independently represent a member selected from the group consisting of hydrogen, halogen, lower alkyl having 1–6 carbon atoms, lower alkoxy having 1–6 carbon atoms, amino, N-lower alkyl amino wherein the alkyl moiety has 1–6 carbon atoms, N-lower hydroxy alkyl amino wherein the alkyl moiety has 1–6 carbon atoms and acylamino wherein the acyl moiety has 2–7 carbon atoms, with at least one of R_1 and R_4 being said acylamino;

R_2 and R_3 each independently represent a member selected from the group consisting of hydrogen, halogen, lower alkyl having 1–6 carbon atoms, lower alkoxy having 1–6 carbon atoms and acylamino wherein the acyl moiety has 2–7 carbon atoms;

R_5 and R_6 each independently represent a member selected from the group consisting of hydrogen, halogen, lower alkyl having 1–6 carbon atoms and lower alkoxy having 1–6 carbon atoms with the proviso that when both R_5 and R_6 are other than hydrogen at least one of R_5 and R_6 occupies a position meta to —NHR_7; and

R_7 represents a member selected from the group consisting of hydroxy alkyl having 1–6 carbon atoms, amino alkyl having 1–6 carbon atoms, mono alkyl amino alkyl wherein each alkyl moiety has 1–6 carbon atoms and dialkyl amino alkyl wherein each alkyl moiety has 1–6 carbon atoms.

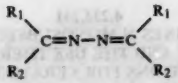
4,233,242

PROCESS FOR PRODUCING KETAZINE BY REACTING A KETONE WITH AMMONIA AND A PEROXIDE

Nobuyuki Nagato, Wako, and Yuichi Sugiyama, Tokyo, both of Japan, assignors to Showa Denko Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 6, 1979, Ser. No. 27,895
Claims priority, application Japan, Apr. 13, 1978, 53-42647; Apr. 13, 1978, 53-42648
Int. Cl.[3] C07C *109/12, 109/14, 109/16, 119/00*
U.S. Cl. 564—249 10 Claims

1. In a process for producing a ketazine having the formula



wherein R_1 represents alkyl group having 1 to 4 carbon atoms and R_2 represents (i) an alkyl group having 1 to 4 carbon atoms or (ii) phenyl or phenyl substituted by alkyl having 1 to 4 carbon atoms, alkoxy having 1 to 4 carbon atoms or halogen, and R_1 and R_2 together with the carbon atom to which they are both bonded form a ring, by reacting an aliphatic or aromatic ketone having the formula:

wherein R_1 and R_2 are as defined above, with ammonia and a peroxide compound or compounds, at a temperature of from 0° to 120° C., in liquid phase, the improvement wherein silica, at least one palladium compound or a mixture thereof is used as a catalyst.

4,233,243

Patent Not Issued For This Number

4,233,244

NOVEL TECHNIQUE FOR REACTING VINYL CYCLOHEXENE WITH NITROBENZENE IN THE PRESENCE OF A HYDROGEN-TRANSFER CATALYST

John A. Patterson, Fishkill, N.Y.; Wheeler C. Crawford, Houston, and James R. Wilson, Missouri City, both of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Sep. 18, 1978, Ser. No. 943,590

Int. Cl.³ C07C *85/11*

U.S. Cl. 564—423 **15 Claims**

1. The method which comprises

passing a charge stream containing vinyl cyclohexene and $R'NO_2$ into contact with a catalytic amount of, as catalyst, at least one acetylacetonate of a Group VIII metal, thereby forming product streams containing $R'NH_2$ wherein R′ is alkyl, cycloalkyl, aralkyl, aryl or alkaryl; and

recovering said product stream containing $R'NH_2$.

4,233,245

PREPARATION OF TRIS(HYDROXYMETHYL)AMINOMETHANE

Jean Bourguignon, Isneauville; Marcel-Xavier Sion, Lewarde, and Michel Moreau, Rouen, all of France, assignors to Societe Chimique de La Grande Paroisse, Azote et Produits Chimiques, Paris, France

Filed Jan. 25, 1979, Ser. No. 6,794

Claims priority, application France, Jan. 25, 1978, 78 01965

Int. Cl.³ C07C *85/11*

U.S. Cl. 564—506 **7 Claims**

1. in a process of preparing tris(hydroxymethyl)aminomethane in crystalline form separated directly by cooling of the reaction medium, the process comprising formylation followed by hydrogenation, the improvement wherein nitromethane and formaldehyde, in polyoxymethylene or solid form, are reacted to effect said formylation in a molar ratio on the order of 1:3 in a concentrated alcohol medium of 2 to 5% mixture of methylene chloride in methanol, in the presence of 1 to 10 milliequivalents per mole of nitromethane of a basic catalyst in solid form, selected from sodium or potassium, with agitation for a period between 2 and 36 hours at a temperature below 55° C.; and the product of the formylation is acidified with concentrated acid to a pH between 4.5 and 5.5, the resultant acidified nitroalcohol is diluted with methanol containing 2 to 5% methylene chloride, and is then catalytically hydrogenated on Raney nickel at a hydrogen pressure of 30 to 60 bars at a temperature of 40 to 47° C.

4,233,246

MANUFACTURE OF ALIPHATIC HYDROXYCARBONYL COMPOUNDS ETHERIFIED WITH ALIPHATIC GROUPS

Christian Dudeck, Limburgerhof; Gunter Lehmann, Ludwigshafen; Norbert Petri, Frankenthal; Hans Diem, Mannheim; Werner Fliege, Otterstadt; Bernd Meissner, Heidelberg; Karl-Heinz Ross, Mutterstadt, and Wolfgang Muehlthaler, Hemsbach, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 20, 1978, Ser. No. 971,416

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1977, 2758124; Apr. 12, 1978, 2815752

Int. Cl.³ C07C *45/38*

U.S. Cl. 568—402 **12 Claims**

1. A process for the preparation of an aliphatic hydroxycarbonyl compound etherified with an aliphatic group, by catalytic oxidation of an etherified hydroxyalcohol in the presence of a metal catalyst, wherein an aliphatic hydroxyalcohol, etherified with an aliphatic group, is oxidized with an oxygen-containing gas, at from 450° to 700° C., in the presence of a catalyst arranged according to particle size in an upper or front region, middle region and a lower or rear region which have a total thickness of from 5 to 100 millimeters and comprise:

(a) at least three layers of silver crystals of different particle size, with at least one of the layers of silver crystals constituting the lower or rear region of the catalyst from which the oxidized mixture is discharged containing particles of size from 1 to 2.5 mm and constituting from 30 to 85 percent by weight of the catalyst, at least one of the layers of silver crystals constituting the middle region of the catalyst containing particles of size from 0.75 to 1 mm and constituting from 2 to 30 percent by weight of the catalyst and at least one of the layers of silver crystals constituting the upper or front region of the catalyst facing the mixture to be oxidized containing particles of size from 0.2 to 0.75 mm and constituting from 8 to 50 percent by weight of the catalyst, and at least one layer of copper crystals arranged above or below one of said layers of silver crystals and containing particles of size from 0.2 to 0.75 mm and constituting from 1 to 40 percent by weight of the catalyst, or

(b) at least three layers of silver crystals of different particle size, with at least one of the layers of silver crystals constituting the lower or rear region of the catalyst from which the oxidized mixture is discharged containing particles of size from 1 to 2.5 mm and constituting from 30 to 85 percent by weight of the catalyst, at least one of the layers of silver crystals constituting the middle region of the catalyst containing particles of size from 0.75 to 1 mm and constituting from 2 to 30 percent by weight of the catalyst and at least one of the layers of silver crystals constituting the upper or front region of the catalyst facing the mixture

to be oxidized containing particles of size from 0.2 to 0.75 mm and constituting from 8 to 50 percent by weight of the catalyst, and at least one layer of copper crystals arranged above or below one of said layers of silver crystals containing particles of size from 0.2 to 0.75 mm and constituting from 0.5 to 40 percent by weight of the catalyst, and at least one layer of catalyst particles comprising from 70 to 99 percent by weight of copper, from 0.9 to 20 percent by weight of tin and from 0.1 to 10 percent by weight of phosphorus, based on the total weight of these elements in these particles, with these layers of catalyst particles containing particles of size from 0.2 to 0.75 mm and constituting from 0.5 to 10 percent by weight of the catalyst, or

(c) at least three layers of silver crystals of different particle size, with at least one of the layers of silver crystals constituting the lower or rear region of the catalyst from which the oxidized mixture is discharged containing particles of size from 1 to 2.5 mm and constituting from 30 to 85 percent by weight of the catalyst, at least one of the layers of silver crystals constituting the middle region of the catalyst containing particles of size from 0.75 to 1 mm and constituting from 2 to 30 percent by weight of the catalyst and at least one of the layers of silver crystals constituting the upper or front region of the catalyst facing the mixture to be oxidized containing particles of size from 0.2 to 0.75 mm and constituting from 13 to 68 percent by weight of the catalyst.

4,233,247

PROCESS FOR THE PREPARATION OF 2,2-DIMETHYLOLALKANALS

Otto Immel, and Hans-Helmut Schwarz, both of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

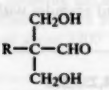
Filed Mar. 13, 1978, Ser. No. 886,218

Claims priority, application Fed. Rep. of Germany, Apr. 1, 1977, 2714516

Int. Cl.³ C07C *47/26*

U.S. Cl. 568—464 **11 Claims**

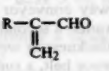
1. A process for the preparation of a 2,2-dimethylolalkanal of the formula



(I)

wherein R denotes an unsubstituted straight chain or branched alkyl radical with up to 15 carbon atoms or a C_1 to C_4 alkoxy substituted straight or branched alkyl radical with up to 15 carbon atoms,

which comprises contacting a 2-alkylacrylaldehyde of the formula



(II)

wherein R has the meaning indicated above, with formaldehyde in the presence of water and a hydroxide or carbonate of an alkali metal or alkaline earth metal, a tertiary amine or a basic ion exchanger employing a molar ratio of 2-alkylacrylaldehyde to formaldehyde of 1:8 to 1:30 and a temperature in the range of −10° C. to 100° C.

4,233,248

PROCESS FOR OXIDATION OF METHANOL TO FORMALDEHYDE WITH NITROUS OXIDE

V. N. Mallikarjuna Rao, and Stanislaw B. Ziemecki, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 21, 1979, Ser. No. 13,122

Int. Cl.³ C07C *47/052, 45/29*

U.S. Cl. 568—487 **12 Claims**

1. The process of making formaldehyde which comprises continuously passing, for a contact time of 0.001 to 0.2 second, a gaseous mixture of methanol and nitrous oxide in a methanol to nitrous oxide mole ratio of 0.5 to 4.0, over a metallic silver, metallic silver: gold alloy, or metallic silver: copper alloy catalyst bed which is either unsupported or supported and contains at least about 3 weight percent silver metal, wherein the silver alloy present contains at least 2.5 mole percent silver maintained at a temperature of 475° to 675° C.

4,233,249

METHOD FOR THE PREPARATION OF ALKALI METAL SALTS OF DINITROMETHANE

Výtautos Grakauskas, Arcadia, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 26, 1979, Ser. No. 33,608

Int. Cl.³ C07C *76/02*

U.S. Cl. 568—926 **5 Claims**

1. A method for synthesizing the alkali metal salts of dinitromethane which comprises the steps of

(A) effecting a reaction between methyl malonate and a nitrating agent to produce methyl dinitroacetate; and

(B) reacting the resulting methyl dinitroacetate reaction product with an aqueous solution of an alkali metal hydroxide at a temperature of from about 65° C. to 85° C. for a period of time sufficient to produce an alkali salt of dinitromethane.

4,233,250

PROCESS FOR SYNTHESIZING THE ALKALI METAL SALTS OF DINETROMETHANE

Vytautos Grakauskas, Arcadia, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 26, 1979, Ser. No. 33,610

Int. Cl.³ C07C *76/02*

U.S. Cl. 568—926 **4 Claims**

1. A process for preparing the alkali metal salts of dinitromethane which comprises the steps of

(A) effecting the nitration of methyl cyanooximinoacetate to produce methyl cyanodinitroacetate;

(B) effecting the hydrolysis of the resulting cyanodinitroacetate to produce dinitroacetonitrile;

(C) effecting the neutralization of said dinitroacetonitrile with an alkali metal hydroxide to produce the corresponding alkali metal salt of cyanodinitromethide; and

(D) effecting the saponification of said cyanodinitromethide salt with an aqueous solution of an alkali metal hydroxide at a temperature and for a time period sufficient to produce the corresponding alkali metal salt of dinitromethane.

4,233,251
PROCESS FOR PREPARING HEXACHLOROCYCLOPENTADIENE

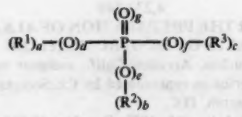
Glendon D. Kyker, Glen Ellyn, and Kalidas Paul, Bolingbrook, both of Ill., assignors to Velsicol Chemical Corporation, Chicago, Ill.

Filed Jun. 18, 1979, Ser. No. 49,854
Int. Cl.³ C07C *23/08*
U.S. Cl. 570—220 **10 Claims**

1. A process for the production of hexachlorocyclopentadiene comprising the steps of:

(a) reacting liquid cyclopentadiene and chlorine at a temperature of from about 0 to about 100 degrees centigrade until a minimum of four chlorine atoms has been added per mole of cyclopentadiene to form a first-stage product;

(b) heating the resultant liquid reaction product of step (a) in a second stage at a temperature of from about 140 degrees centigrade to below about 200 degrees centigrade with chlorine in the presence of from about 0.0001 percent to about 1.0 percent (by weight) of a phosphorus compound until the reaction products of step (a) contain an average of about 6 chlorine atoms per molecule, based on cyclopentadiene starting material, wherein said phosphorus compound is



wherein a, b, c, d, e, f, and g are integers independently selected from the group consisting of 0 and 1, and R^1, R^2, and R^3, are independently selected from the group consisting of hydrogen, hydroxyl, fluorine, chlorine, bromine, iodine, alkyl containing from about 1 to 12 carbon atoms, phenyl, and halophenyl;

(c) vaporizing and heating the resulting reaction products of step (b) in a third stage in the presence of chlorine to a temperature of above 450 degrees centigrade until at least a major portion of said products are converted to hexachlorocyclopentadiene; and

(d) recovering therefrom hexachlorocyclopentadiene.

4,233,252
BUTADIENE CHLORINATION PROCESS

Terry W. Redwine, La Place, La., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 9, 1977, Ser. No. 823,096
Int. Cl.³ C07C *21/09*
U.S. Cl. 570—231 **9 Claims**

1. An improved process for the continuous chlorination in vapor phase of butadiene to a mixture of dichlorobutenes, the process comprising the following steps:

1. premixing chlorine with a portion of the total butadiene, the mole ratio of butadiene to chlorine in the mixture being at least 3:1 but no more than 30:1, and the temperature of the mixture being at least 90° C. but no more than 200° C.;

2. continuously introducing the chlorine-butadiene mixture at one end of a tubular reactor maintained above 90° C., while introducing the remainder of butadiene into the reactor at at least one point downstream from the injection point of the chlorine-butadiene mixture, the temperature of butadiene at each injection point being lower than the temperature of the reacting mixture at that point, both the temperature and the volume of this additional butadiene being adequate to prevent the internal temperature in the reactor from exceeding about 250° C. or falling downstream from any butadiene injection point below about 130° C.; and

3. recovering dichlorobutenes from the reactor effluent.

4,233,253
METHOD FOR THE PREPARATION OF METAL SALTS OF PHOSPHORUS ACID ESTERS

Glen R. Hoff, Naperville, Ill., and Peter Fotis, Highland, Ind., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Dec. 26, 1978, Ser. No. 972,822
Int. Cl.³ C07F *9/09*
U.S. Cl. 260—987 **8 Claims**

1. A process for the preparation of metal salts of phosphorus acid esters useful in the preparation of alpha-olefin polymerization catalyst components comprising reacting, under substantially anhydrous conditions, (1) at least one anhydrous divalent magnesium, calcium, manganese or iron salt of a monocarboxylic acid selected from the group consisting of aliphatic acids of 2 to about 20 carbon atoms, aromatic acids of 7 to about 12 carbon atoms, and aliphatically-substituted aromatic acids and aryl-substituted aliphatic acids of 8 to about 20 carbon atoms; and (2) at least one trialkyl orthophosphate having 1 to about 6 carbon atoms per alkyl radical in amounts such that a phosphorus acid ester salt having at least one phosphorus acid ester group bonded to metal through oxygen is formed, and at a temperature such that the divalent metal salt of a monocarboxylic acid and the trialkyl orthophosphate will react without substantial decomposition of the trialkyl orthophosphate.

4,233,254
PROCESS FOR GRANULATING METAL SULFIDE POWDERS

Haruki Sato, and Yoshio Kawasumi, both of, Urawa, Japan, assignors to Nihon Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 22, 1978, Ser. No. 972,649
Claims priority, application Japan, Jan. 9, 1978, 53/530
Int. Cl.³ B01J *2/10*
U.S. Cl. 264—37 **15 Claims**

1. A process for granulating metal sulfide powders, which comprises the steps of

(a) adding and mixing a solution of thermosetting resin in a volatile organic solvent, as a binder, to a metal sulfide powder as the starting material,

(b) forming the mixture obtained in the step (a) into granules by a granulator,

(c) drying the granules at a temperature below the hardening temperature of said thermosetting resin,

(d) sieving the dried granules for classification and recovering the granules within desired limits of particle size,

(e) recycling the fines after the sieve classification to the granulator with the addition of said volatile organic solvent, and

(f) heating and curing said granules within the desired limits of particle size.

4,233,255
METHOD FOR CONTROLLING THE THICKNESS OR WEIGHT OF EXTRUDED STOCK

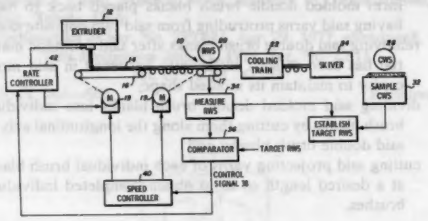
William S. Moon, San Jose, Calif., assignor to Measurex Corporation, Cupertino, Calif.

Filed Nov. 29, 1978, Ser. No. 964,502
Int. Cl.³ B29F *3/02*
U.S. Cl. 264—40.4 **2 Claims**

1. In a process comprising an extruder, having a rate of extrusion, a continuous sheet length of elastomeric extrusion, a first variable speed take-away conveyor belt to convey the extrusion as it exits the extruder, a second variable speed conveyor belt for varying the thickness or weight of the extrusion after leaving the first conveyor belt, a running-weigh-scale to measure the weight per unit area of the continuous extrusion after said extrusion commences to be conveyed by said second conveyor, and an a priori determined targeted running-weigh-scale value; a method of controlling the thickness or weight of the extruded elastomer comprising the steps of:

measuring the weight value of the extrusion at the running-weigh-scale;

comparing the targeted running-weigh-scale value to said measured value to obtain a control signal; and



adjusting the difference in speed between said first conveyor belt and said second conveyer belt in response to said control.

4,233,256

PROCESS FOR INJECTION MOLDING SINTERABLE CARBIDE CERAMIC MATERIALS

Roger W. Ohnsorg, Niagara Falls, N.Y., assignor to The Carborundum Company, Niagara Falls, N.Y.

Division of Ser. No. 864,415, Dec. 27, 1977, Pat. No. 4,144,207. This application Dec. 18, 1978, Ser. No. 970,702

Int. Cl.³ C04B *33/32, 35/64*

U.S. Cl. 264—44 **7 Claims**

1. A process for producing a sintered carbide ceramic article comprising the steps of:

a. forming a homogeneous mixture containing from about 65 to about 86 percent by weight of a sinterable carbide ceramic material; from about 0.2 to about 0.5 percent by weight of a sintering aid of boron or beryllium selected from the group of elemental beryllium, beryllium compounds, elemental boron, boron compounds, or mixtures thereof; from about 14 to about 30 percent by weight of a mixture of thermoplastic resin and at least one oil or wax having a lower volatilizing temperature than said resin; and a carbon source material sufficient to provide from about 0.5 to about 5.0 percent by weight excess carbon,

b. injection molding said mixture to produce a molded product,

c. removing said thermoplastic resin by baking said molded product at a temperature between about 450° C. and about 1000° C. to produce a porous baked product, consisting of ceramic material, sintering aid and excess carbon,

d. sintering said baked product at a temperature between about 2000° C. and about 2200° C. to produce a sintered product.

4,233,257

METHOD OF MAKING A LIQUID JUNCTION FOR A REFERENCE ELECTRODE

Hiroshi Maruyama, and Masashi Watanabe, both of Kyoto, Japan, assignors to Horiba, Ltd., Kyoto, Japan

Division of Ser. No. 705,284, Jul. 14, 1976, abandoned. This application May 2, 1978, Ser. No. 902,836

Claims priority, application Japan, Jul. 14, 1975, 50-85944

Int. Cl.³ B29F *5/02*; G01N *27/30*

U.S. Cl. 264—113 **6 Claims**

1. A method of forming a liquid junction for a reference electrode comprising:

forming a first support layer of polytetrafluoroethylene alone in a mold;

compressing said first support layer;

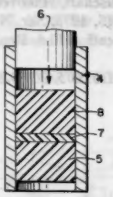
forming a second liquid junction layer on top of said compressed first layer, said second layer comprising one material selected from the group consisting of:

a mixture of a polytetrafluoroethylene and an inactive particulate substance

a mixture of polytetrafluoroethylene and an electro-chemically inactive salt, and

a mixture of polytetrafluoroethylene, an inactive particulate substance, and an electro-chemically inactive salt;

compressing said second liquid junction layer;



forming a third support layer of polytetrafluoroethylene alone on top of said compressed second liquid junction layer;

compressing said third support layer; and

sintering said three compressed layers.

4,233,258

METHOD FOR PREPARING ADDITION TYPE POLYIMIDE PREPREGS

Terry L. St. Clair, Poquoson, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Division of Ser. No. 839,963, Oct. 6, 1977, Pat. No. 4,166,170. This application Feb. 13, 1979, Ser. No. 11,737

Int. Cl.³ B32B *27/12*

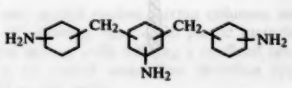
U.S. Cl. 264—137 **5 Claims**

1. A method for preparing a novel addition type polyimide prepreg comprising the steps of reacting equimolar quantities of benzophenonetetracarboxylic acid dianhydride and norbornene dicarboxylic acid anhydride in an excess of absolute ethanol while heating to 50°–60° C. until solution occurs, cooling the resulting solution of ethylesters to room temperature and adding the cooled solution to a vessel containing an equimolar solution of mixed dianilines, stirring the combined solution for approximately one hour to obtain a homogeneous ester-acid polyimide prepolymer adaptable for "hot-melt" prepreg applications as a liquid resin system, and including the further steps of applying the liquid resin system onto fibers after heating the resin to 50°–70° C. to lower the resin viscosity adqequately to permit prepregging in the absence of a carrier solvent and wherein the mixed dianilines are the isomers of methylenedianilines and in the following percentages:

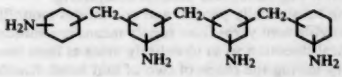
o,o'—MDA—3.20%

o,p'—MDA—15.70%

p,p'—MDA—66.00%



4.50% (all isomers)



10.60% (all isomers).

4,233,259

METHOD OF AND APPARATUS FOR PRODUCING PROFILED STRANDS FROM ELASTOMERIC MATERIAL

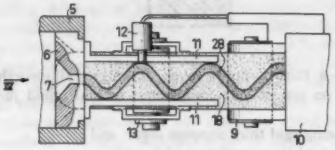
Udo Pietratus, Northeim, and Fritz Röthemeyer, Isernhagen, both of Fed. Rep. of Germany, assignors to Continental Gummi-Werke Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Oct. 16, 1978, Ser. No. 951,638

Claims priority, application Fed. Rep. of Germany, Oct. 14, 1977, 2746201

Int. Cl.[3] D01D *5/20*; B29D *7/00*

U.S. Cl. 264—167 13 Claims



1. A method of continuously producing a profiled strand from elastomeric material, especially an undulated edge, for a wavy-edge conveyor belt, comprising a linear base and a ridge placed on the base, which includes in combination therewith the step of:

extruding elastomeric material in the form of the desired profiled strand while concurrently imparting different flow velocities to said elastomeric material at different portions of the cross section of said strand so that at least one portion of said strand changes direction in tapering pockets along its length.

4,233,260

PROCESS FOR THE MANUFACTURE OF BRUSHES

Etienne, Y. G. J. d'Argembeau, 14 Rue de Belle-Vue, B-1050Brussels, Belgium

Filed Feb. 22, 1979, Ser. No. 13,995

Claims priority, application Luxembourg, Feb. 28, 1978, 79138

Int. Cl.[3] B29D *31/00*

U.S. Cl. 264—243 7 Claims

1. A process for the continuous manufacture of tooth brushes comprising a bristle or pile carrying head and a handle integral with said head, said process comprising:

drawing substantially parallel and continuous monofilament or polyfilament yarns from supply means in a substantially vertical direction so as to entirely cross at least one mold cavity having the shape of two of said brush handles and heads placed back to back so as to project outside two opposite sides of said mold in a direction substantially perpendicular to said mold cavity at a part of said cavity having said shape of two brush heads placed back to back;

injecting a synthetic liquid or pasty thermoplastic or thermohardening material into said mold cavity so as to cause said parts of said parallel yarns crossing said mold cavity to be embedded into said synthetic material, to thereby form molded double brush blanks placed back to back having said yarns protruding from said two opposite sides;

removing said double brush blanks after said synthetic material has been at least sufficiently hardened in said mold cavity to maintain its molded shape;

dividing said molded double brush blanks into individual brush blanks by cutting them along the longitudinal axis of said double brush blanks; and

cutting said projecting yarns of each individual brush blank at a desired length so as to obtain completed individual brushes.

4,233,261

METHOD AND DEVICE FOR MANUFACTURING INFORMATION CARRIERS

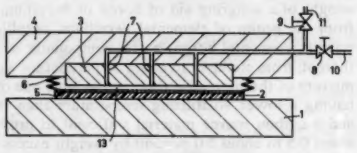
Andries Mijnheer, Eindhoven, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 23, 1978, Ser. No. 880,505

Claims priority, application Netherlands, Sep. 28, 1977, 7710555

Int. Cl.[2] B29C *17/00*

U.S. Cl. 264—293 4 Claims



1. A method of manufacturing information carriers from a thermoplastic material, comprising first bringing a relatively thin die into contact with a relatively thick surface heated to a temperature slightly above the melting temperature of a solid thermoplastic substrate while maintaining said die spaced from said substrate, then maintaining the contact between the heated surface and the die and the spatial separation between the die and the substrate for a time sufficient to permit the die to acquire the temperature of the heated surface, then separating the die from the heated surface with an insulating layer of gas, and finally pressing the die against the thermoplastic substrate immediately thereafter by means of pneumatic pressure derived from said gas.

2. A device for manufacturing record carriers from a solid thermoplastic material, comprising a relatively thin information carrying die, a relatively thick block positioned in opposed relationship to said die and heated to a temperature slightly higher than the melting temperature of the thermoplastic material, means to position and support said thermoplastic material on a side of the die opposite and spaced from said block, and pressing means for alternately moving the die into a position spaced from said thermoplastic material and abutting the block and for thereafter moving the die to an alternate position spaced from the block and in contacting relationship with said thermoplastic material and for providing an insulting gas layer between the die and the block when the die is in the alternate position.

4,233,262

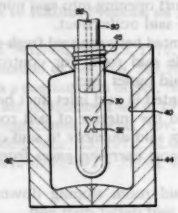
METHOD OF FORMING BLOWN POLYETHYLENE TEREPHTHALATE CONTAINERS

Nicholas J. Curto, Monroe, Mich., assignor to Owens-Illinois, Inc., Toledo, Ohio

Continuation of Ser. No. 789,483, Apr. 21, 1977, abandoned. This application Jan. 11, 1979, Ser. No. 2,511

Int. Cl.³ B29C *17/07*

U.S. Cl. 264—509 8 Claims



1. In a method of forming a blown shape of polyethylene terephthalate having an exterior intaglio surface design, the steps of:

forming a blowable preform of polyethylene terephthalate having an exterior intaglio surface design defined by adjacent thick and thin wall portions destined to form the intaglio design in the blown container;

enclosing the blowable preform within a blow mold cavity having a smooth wall portion;

thermally conditioning the preform to a temperature in a range where the material is susceptible to strain hardening;

introducing blow fluid under pressure into the interior of the preform and thereby (1) expanding the preform outwardly to conform to said cavity, including contacting both the thick and thin wall portions of said design with said blow mold cavity wall portion, (2) strain hardening the preform, and (3), proportionately expanding the thick and thin portions of said design; and thereafter venting fluid under pressure from the interior of said blown shape to allow removal from the mold of the blown shape having said exterior intaglio surface design.

4,233,263

METHOD OF MAINTAINING BACTERIAL STERILITY IN URINE DRAINAGE BAGS

Anthony J. Schaeffer, Western Springs, Ill., assignor to Northwestern University, Evanston, Ill.

Filed Apr. 2, 1979, Ser. No. 25,753

Int. Cl.³ A01N *59/00;* A61B *19/00;* A61L *2/18;* A61M *27/00*

U.S. Cl. 422—28 7 Claims

1. The method of maintaining bacterial sterility in a urine drainage bag of a closed urinary drainage system, wherein urine is collected in said bag for several hours and then emptied therefrom, consisting essentially of introducing into said bag before each period of urine collection from 15 to 60 milliliters of an aqueous solution of hydrogen peroxide (H_2O_2) containing from 0.025 to 0.035 grams of H_2O_2 per milliliter.

4,233,264

APPARATUS FOR PRODUCING A GASEOUS HYDROCARBON/AIR MIXTURE AND FOR THE CATALYTIC OXIDATION OF THIS MIXTURE

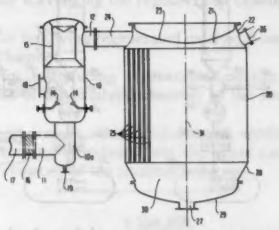
John H. Maude, Cologne; Lothar Sterck, Hürth, and Alfred Vilshöfer, Elsdorf, all of Fed. Rep. of Germany, assignors to Davy International AG, Frankfurt, Fed. Rep. of Germany

Filed Oct. 12, 1978, Ser. No. 950,794

Claims priority, application Fed. Rep. of Germany, Oct. 12, 1977, 2745765

Int. Cl.³ B01J *3/04, 10/00, 8/06;* G05B *9/00*

U.S. Cl. 422—117 11 Claims



1. Apparatus for forming a gaseous hydrocarbon/air mixture and for subsequently catalytically oxidizing said mixture, said apparatus comprising an evaporator having an air inlet pipe on the inflow side of said evaporator, an outlet pipe for said mixture on the outflow side of said evaporator and at least one injection nozzle positioned between said inlet and outlet pipes suitable for injecting hydrocarbon into said evaporator, and a shell-and-tube reactor comprising a plurality of parallel, externally cooled, catalyst-filled tubes, a hood on the upstream side of the tubes and a hood on the downstream side of the tubes, said hood on the downstream side being substantially convex-shaped as viewed from the exterior of said reactor and said hood on the upstream side being substantially concave-shaped as viewed from the exterior of said reactor such that the volume of the upstream hood is substantially reduced compared with the volume of an outwardly curved hood, said upstream hood being in communication with the outlet pipe of said evaporator.

4,233,265

LIQUID POLYMER HYDRATION

Kenneth E. Gasper, Overland Park, Kans., assignor to Olin Corporation, New Haven, Conn.

Division of Ser. No. 961,310, Nov. 16, 1978, Pat. No. 4,201,867. This application Jul. 25, 1979, Ser. No. 60,558

Int. Cl.³ B01F *5/00, 15/02*

U.S. Cl. 422—135 4 Claims

1. An apparatus for the hydration of liquid polymers comprising:

(a) first and second packed mixing columns, said columns made of oxidizing agent-inert plastic material, and said columns having walls defining a confined space for fluid flow in an overall mean flow direction approximately parallel to said walls;

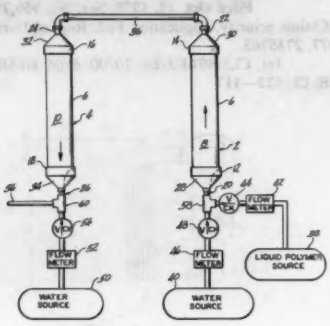
(b) two reducing couplings for each of said columns, one of said couplings being located at one end of said column and attached to said walls to form an inlet and the other of said couplings being located at the other end of said column and attached to said walls of said column to form an outlet, said couplings having surfaces which reduce the cross-sectional area of said confined space defined by said column walls, said coupling surfaces forming an angle of at least 110° with said column walls;

(c) said outlet of said first mixing column connected to said inlet of said second mixing column by means of a reducing passageway; the ratio of the average cross-sectional areas

between said confined spaces defined by said column walls and said confined space defined by the reducing passageway walls is from about 4:1 to about 20:1,

(d) a first check valve connected to said inlet of said first mixing column;

(e) a liquid polymer source;



(f) a metering means connecting said first check valve to liquid polymer source;

(g) a second check valve connected to said inlet of said first mixing column;

(h) a water source; and

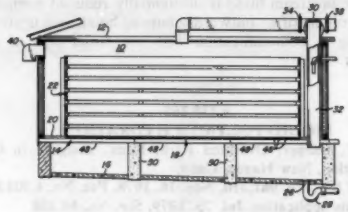
(i) a second metering means connecting said second check valve with said water source.

4,233,266

BULK PASTEURIZATION OF MUSHROOM COMPOST

David A. Kummer, P.O. Box 271, Elburn, Ill. 60119

Filed Sep. 18, 1978, Ser. No. 943,135
Int. Cl.³ B01J *19/00;* **C05F** *11/08;* **C12M** *1/04*
U.S. Cl. 422—184 **2 Claims**



1. Apparatus for use in the bulk pasteurization and aeration of mushroom compost, comprising

an enclosed room having a chamber therein,

a floor spaced from the bottom of said room to provide a space below said floor,

said floor having an imperforate peripheral portion surrounding a central perforate portion,

an upright perforate wall extending upwardly from said floor in surrounding relationship with said central perforate portion,

said wall being spaced from the sides of said room to provide a space within said room surrounding said wall,

the imperforate peripheral portion of said floor defining the bottom of said space surrounding said wall and being connected to the sides of said room,

a passageway connected between the top of said chamber and said space below said floor,

blower means connected in said passageway for blowing air from the top of said chamber to said space below said floor and including

a blower having an inlet and an outlet, an inlet duct forming a part of said passageway connected between said chamber and said inlet of said blower, and an outlet duct forming a part of said passageway connected between said outlet of said blower and said space below said floor,

steam emitting means opening into said passageway downstream of said blower means for adding steam to the air blown into said space below said floor,

a fresh-air inlet port opening into said inlet duct, for supplying fresh air to said outlet duct,

valve means mounted between said fresh-air inlet port and a location outside said room for controlling the flow of fresh air into said outlet duct,

valve means mounted in said inlet duct between the inlet of said blower and the interior of said room to control the flow of air from said chamber to said outlet duct,

an open exhaust port carrying gases from said chamber to the ambient,

the bottom of said room sloping downwardly toward a position below said outlet duct and

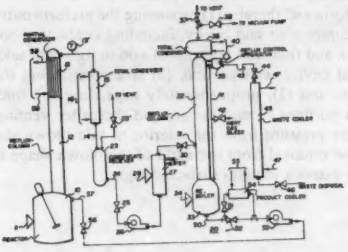
a liquid drain located at the bottom of said room below said outlet duct.

4,233,267

COMBINED BATCH REACTOR SYSTEM AND CONTINUOUS DISTILLATION APPARATUS

Robert J. Coker, Petrolia; Gary W. Bate, Point Edward, and Henk J. Deuzeman, Watford, all of Canada, assignors to Fiberglas Canada Limited, Toronto, Canada

Filed Jan. 18, 1978, Ser. No. 870,519
Claims priority, application Canada, Jan. 18, 1977, 269956
Int. Cl.³ B01D *3/10;* **B01J** *14/00*
U.S. Cl. 422—187 **8 Claims**



1. An apparatus comprising a batch reactor system having a condensate output and a distillation apparatus in fluid communication with the condensate output; the batch reactor system comprising a batch reactor, a reflux column in communication with the batch reactor and a first total condenser for receiving and condensing a vapour effluent containing volatile by-products and reactants from the reflux column; the distillation apparatus comprising:

condensate receiving means including a condensate inlet coupled to said condensate output for receiving and temporarily storing condensate from the first condenser so that the distillation apparatus has operating parameters which are substantially independent of the operating parameters of the batch reactor system;

distillation column means for separating said by-products and reactants, the distillation column means including a reboiler disposed at a low end thereof and a vapour effluent oiutlet at the opposite end; and

feed preheater means having an inlet in fluid communication with an outlet of said receiver means, evaporator means to vaporize condensate input thereto and an outlet feed in fluid communication with a vapour inlet of the distillation column means, whereby vaporized condensate is continu-

ously separated into volatile by-products at the vapour effluent outlet and volatile reactants in the distillation column means independent of the temperature and pressure conditions in the batch reactor and the rate and composition of effluent from the reflux column.

4,233,268

APPARATUS FOR HYDROCARBON CONVERSION

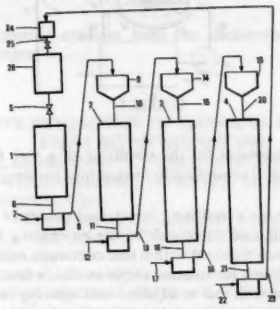
Roger Boret, Le Pecq; Charles Bronner, Chatou; Roland Huin, Montesson-la-Borde, and Andre Vidal, Le Vesinet, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Division of Ser. No. 741,744, Nov. 15, 1976, Pat. No. 4,133,743, which is a continuation of Ser. No. 589,987, Jun. 24, 1975, abandoned, which is a continuation of Ser. No. 305,797, Nov. 13, 1972, abandoned. This application Dec. 6, 1978, Ser. No. 966,994

Claims priority, application France, Nov. 16, 1971, 71.41069; Feb. 7, 1972, 72.04055; Mar. 13, 1972, 72.08731

Int. Cl.³ B01J *8/02, 8/12, 23/90;* **C10G** *11/16*

U.S. Cl. 422—190 **2 Claims**



1. An apparatus for carrying out a catalytic hydrocarbon conversion process, comprising (a) at least two chambers of unequal volumes, connected in series and placed vertically side by side, each of said chambers containing, when in operation, a moving catalyst bed for carrying out the conversion of hydrocarbons, (b) an accumulator-decantor vessel in which used catalyst accumulates and (c) a fixed-bed regeneration chamber for regenerating used catalyst placed below the accumulator-decantor vessel, said apparatus further comprising:

an inlet connected to the upper part of each catalytic chamber for introducing a charge therein, fresh charge being introduced into the catalytic chamber of the smallest volume,

an outlet connected to the lower part of each catalytic chamber for withdrawing a charge therefrom,

heating means communicating with the outlet of each catalytic chamber, except the chamber of the greatest volume, and with the inlet of the succeeding catalytic chamber for heating the charge withdrawn from the preceding catalytic chamber, before its introduction into the succeeding catalytic chamber,

means for introducing catalyst at the top portion of each catalytic chamber,

means for withdrawing catalyst from the bottom portion of each catalytic chamber,

lift means for conveying catalyst withdrawn from the bottom portion of each catalyst chamber, except the chamber of the greatest volume, to the top portion of the succeeding catalytic chamber,

lift means for conveying catalyst withdrawn from the bottom of the catalytic chamber of the greatest volume to the accumulator-decantor vessel,

means for supplying each lift means with recycle hydrogen for use as the driving fluid for conveying catalyst,

duct means for transferring the catalyst accumulated in the accumulator-decantor vessel to the regeneration chamber,

means for isolating the regeneration chamber from the rest of the apparatus,

means for supporting a fixed catalyst bed in the regeneration chamber,

one or more inlets connected to the regeneration chamber for introduction therein of a gas containing molecular oxygen and an inert gas,

an inlet connected to the regeneration chamber for introducing therein a halogenated compound,

an outlet connected to the regeneration chamber for discharging the gases therefrom,

means for scavenging the regeneration chamber with nitrogen,

means for removing regenerated catalyst from the regeneration chamber,

means for introducing regenerated catalyst into the top portion of the catalytic chamber of the smallest volume, and

a compartment in which regenerated catalyst is reduced before being introduced into the upper part of the catalytic chamber of the smallest volume.

4,233,269

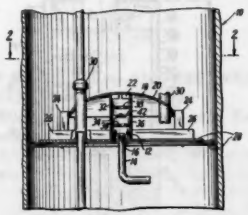
GAS LIQUID DISTRIBUTOR

Larry A. Kaye, Stanhope, and Robert M. Koros, Westfield, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 777,028, Mar. 14, 1977, abandoned. This application Nov. 9, 1978, Ser. No. 959,306

Int. Cl.³ B01F *3/08;* **B01J** *12/00, 14/00*

U.S. Cl. 422—207 **14 Claims**



1. In an upward flow reactor chamber having a chamber wall and an inlet feed conduit located therein which is substantially smaller in its cross-section than the corresponding cross-section defined by said chamber wall and has inlet and upper outlet ends, said inlet end of said inlet conduit receiving an upward directed fluid stream, flow distributor means situated adjacent and downstream of and above said inlet conduit for directing flow in a general direction from said outlet end of said inlet conduit upward into said chamber, wherein the improvement comprises:

quench inlet means extending through said chamber wall and operably associated with said inlet conduit for injecting a quench liquid stream directly into said inlet conduit for upward flow in the same direction as said fluid stream wherein said fluid and quench liquid streams received by said inlet conduit are mixed, horizontal support means extending transversely across the entire cross-section of said chamber and having a single inlet feed opening in which said inlet feed conduit is located, said flow distributor means located downstream of and above proximate the outlet end of said inlet conduit for receiving said fluid and quench liquid streams and including at least a main member having a periphery and bottom surface facing said outlet end of said inlet conduit, said inlet conduit supported so that said outlet end is disposed at least directly adjacent to said bottom surface for directing said upward

flow of said fluid and quench liquid streams from said outlet end thereof against said bottom surface of said flow distributor means, said bottom surface constructed and arranged for cooperation with said upward flow of said streams for directing at least a part of said upward flow around the periphery of said main member into a relatively open flow area within said chamber above said main member, means for supporting said flow distributor means including at least said main member in said chamber in transverse fixed relation relative to said chamber wall, said main member extending transversely for a substantial portion of the cross-section of said chamber and having a greater transverse cross-section than the corresponding cross-section of said outlet end of said inlet conduit, said flow distributor means aiding in the distribution of fluid uniformly over the transverse cross-section of said chamber.

4,233,270

PROCESS AND DEVICE FOR GROWING CRYSTAL

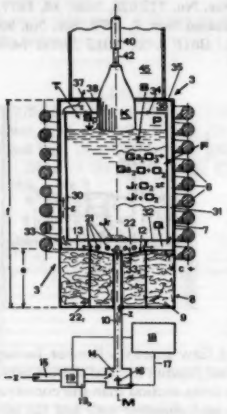
Walter Schmidt, Schaffhausen, Switzerland, assignor to Swiss Aluminium Ltd., Chippis, Switzerland

Division of Ser. No. 820,571, Aug. 1, 1977. This application Oct. 30, 1978, Ser. No. 955,619

Claims priority, application Switzerland, Aug. 5, 1976, 10043/76

Int. Cl.³ B01J *17/18*

U.S. Cl. 422—249 **13 Claims**



1. A device for growing single crystals from a melt in a heated iridium crucible using the Czochralski technique which melt is kept at a temperature substantially above the solidification temperature of said melt in a heated crucible, wherein iridium from said crucible contaminates said melt, which comprises means for cooling at least the bottom of said crucible contacting said melt and the lowest part of the melt resting on the bottom to a temperature above the solidification temperature of said melt but low enough to precipitate said iridium, means for providing an annular space between substantially all of the side walls of said crucible and container for coolant flow in said space, flow distribution means positioned and dimensioned beneath the crucible bottom to provide a greater cooling effect on the bottom of said crucible, said greater cooling effect being sufficient to precipitate said iridium, wherein said cooled region beneath the crucible bottom acts as a nucleation center for precipitation of dissolved iridium and wherein the iridium is precipitated from said region and remains there so that said iridium can no longer enter the crystal, and wherein the service life of the crucible is increased.

4,233,271

ARRANGEMENT FOR THE STERILIZING OF A PACKING MATERIAL WEB

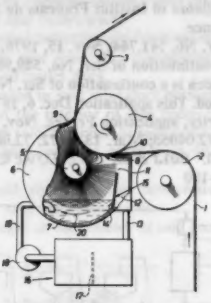
Ernst G. Ernstsson, Staffanstorp, and Alfred Fuchs, Lund, both of Sweden, assignors to Tetra Pak International AB, Lund, Sweden

Filed Apr. 2, 1979, Ser. No. 26,058

Claims priority, application Sweden, Apr. 5, 1978, 7803828

Int. Cl.³ A61L *2/18*; B65B *55/10, 55/24*

U.S. Cl. 422—300 **7 Claims**



1. An arrangement for the sterilizing of a web of packing material which is subsequently formed into packing containers comprising:

a container for a sterilizing liquid, said container having an outer wall, said outer wall having an opening therein;

a rotary brush disposed within said container, means mounting said brush for rotation about an axis, a first portion of said outer wall that is adjacent said opening being closer to said axis than a second portion of said outer wall that is on the opposite side of said opening from said axis, and said outer wall being spaced progressively closer to said axis from said second portion toward said first portion;

said container including a reservoir to receive sterilizing liquid along said second portion; and

means to convey a web of packing material across said opening whereby said rotary brush dips into said reservoir and cooperates with said outer wall to concentrate the flow of sterilizing liquid toward and into contact with said packing material web.

4,233,272

PROCESS FOR SELECTIVE SEPARATION OF URANIUM FROM SOLUTIONS BY MEANS OF AN ION EXCHANGER

Nahit Eresen, Bonn; Klaus Schröer, Bonn-Tannenbusch, and Hans J. Becker, Cologne, all of Fed. Rep. of Germany, assignors to Uranerzbergbau GmbH, Bonn, Fed. Rep. of Germany

Filed Jun. 14, 1977, Ser. No. 806,466

Claims priority, application Fed. Rep. of Germany, Jun. 19, 1976, 2627540

Int. Cl.² C01G *43/00*

U.S. Cl. 423—7 **8 Claims**

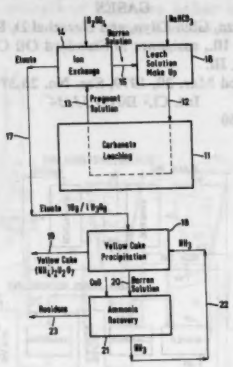
5. A process for obtaining uranium from an ore containing uranium and a material selected from the group consisting of arsenic, copper, molybdenum and lead comprising:

(a) contacting the ore with an acid under oxidizing conditions to thereby form a pregnant liquor containing uranium and the material;

(b) contacting the pregnant liquor with hydrogen sulfide to precipitate a sulfide of the material;

(c) in the absence of an oxidizing step, contacting the hydro-

gen sulfide treated liquor with a chelate-forming cation exchanger; and



(d) recovering uranium from the chelate-forming cation exchanger.

4,233,273

SELECTIVE EXTRACTION OF IRON AND ALUMINUM FROM ACIDIC SOLUTIONS

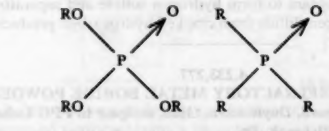
Gustavo A. Meyer; Simon O. Fekete, both of Arvada, and Gordon R. Wicker, Lakewood, all of Colo., assignors to Amax Inc., Greenwich, Conn.

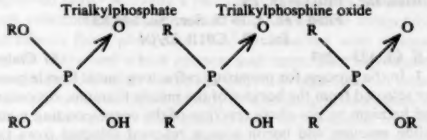
Filed Feb. 16, 1979, Ser. No. 12,783
Int. Cl.³ C01F 7/00; C01G 49/00
U.S. Cl. 423—112 **9 Claims**

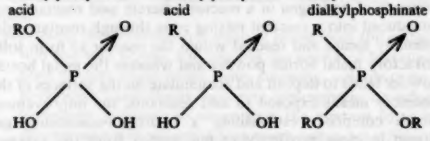
1. A method of selectively extracting trivalent ions of Fe and Al from an acid solution of pH below 4 containing at least one of said ions and also containing at least one of said divalent ions which comprises,

uniformly mixing said solution with a liquid organic extractant comprising by weight about 1% to 40% of an organophosphorus compound and about 5% to 20% of a sulfonic acid dissolved in a water-immiscible organic solvent,

said organophosphorus compound being selected from the group consisting of







where R is a long hydrocarbon selected from the group consisting of n-octyl, 2-ethylhexyl, 3,5,5-trimethylhexyl, 2-ethyl-4-methylpentyl, 2-propyl-4-methylpentyl, octyl-2, diisobutylmethyl, 8-phenylpropyl, phenyl-2-ethylhexyl, n-decyl, n-oxtyl, 2,6,8-trimethylnonyl-4 and 3,9-diethyltridecanol-6,

said sulfonic acid having the general formula

where R is an alkylaromatic hydrcarbon substituent and the mol weight of the sulfonic acid is at least 300

the molar ratio of said sulfonic acid to said organophosphorus compound being 1:4 to 10:1, continuing said mixing for a time sufficient to effect solvent extraction of at least one of said trivalent ions and provide a raffinate impoverished in said trivalent ions and containing at least one of said divalent ions and a loaded extractant containing said trivalent ions,

separating said loaded extractant from said raffinate,

stripping said trivalent ions iron and aluminum from the loaded organic extractant in two stages,

wherein in the first stage the aluminum is selectively stripped by contacting the loaded extractant with a mineral acid of concentration ranging from about 2 N to 6 N while leaving substantially all of the trivalent iron in the extractant,

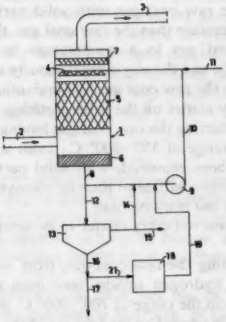
and wherein in the second stage, the trivalent iron is stripped from the extractant by contacting it with a mineral acid of concentration greater than that used in the first stage and ranging from about 4 N to 12 N, the organic extractant being regenerated for recycling into the process.

4,233,274

METHOD OF EXTRACTING AND RECOVERING MERCURY FROM GASES

Torkel Allgulin, Helsingborg, Sweden, assignor to Boliden Aktiebolag, Stockholm, Sweden

Continuation of Ser. No. 911,817, Jun. 2, 1978, abandoned, which is a continuation of Ser. No. 816,131, Jul. 15, 1977, abandoned, which is a continuation of Ser. No. 723,473, Sep. 14, 1976, abandoned. This application Feb. 1, 1979, Ser. No. 8,235
Claims priority, application Sweden, Sep. 16, 1975, 7510341
Int. Cl.² B01D 53/34
U.S. Cl. 423—210 **12 Claims**



1. A method for extraction and recovery of mercury from gases containing gaseous elementary mercury, which comprises

(a) treating the gas containing mercury with an aqueous solution in a closed circuit, the solution containing 0.1–300

mmol/l mercury(II)-ions and at least double that content of ion or ions selected from the group consisting of chlorine, bromine, iodine, cyanide and rhodanide ions with the ability to form soluble complexes with mercury (II)-ions, whereby the mercury in the gas is absorbed in the solution,

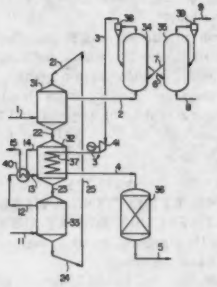
(b) freeing the solution obtained of the mercury absorbed by leading off at least some of the solution, treating the same with a reducing agent and separating precipitated mercury compounds and

(c) after mercury precipitation returning the solution, complex forming ions and mercury (II)-ions to the closed circuit in a quantity sufficient to maintain said concentration in the aqueous solution.

4,233,275
PROCESS AND APPARATUS FOR PURIFYING RAW COAL GAS

Shoichi Kimura; Toshihiko Takahashi, and Zensuke Tamura, all of Kudamatsu, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 1, 1978, Ser. No. 965,512
Claims priority, application Japan, Dec. 2, 1977, 52-143917; Dec. 26, 1977, 52-156603; Mar. 24, 1978, 53-33102
Int. Cl.[3] B01D *53/34*
U.S. Cl. 423—230 16 Claims



1. A process for purifying a high pressure raw coal gas having a temperature in the range of 800° C. or greater and containing tarry matter, hydrogen sulfide and ammonia, which comprises:

contacting the raw coal gas with solid particles having a lower temperature than the raw coal gas, thereby cooling the raw coal gas to a temperature in the range of 550°–800° C., and thereby simultaneously removing tarry matter from the raw coal gas by condensing and depositing the tarry matter on the solid particles;

thereafter contacting the raw coal gas having a temperature within the range of 550°–800° C., from which the tarry matter has been removed, with solid particles that will absorb hydrogen sulfide to thereby remove the hydrogen sulfide from the raw coal gas;

burning the removed tarry matter to produce heat of combustion;

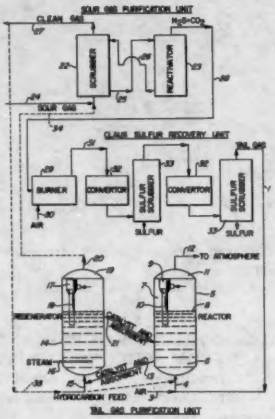
thereafter heating the raw coal gas, from which the tarry matter and hydrogen sulfide have been removed, to a temperature in the range of 700°–900° C. with the heat of combustion produced by the burning of the removed tarry matter; and

thereafter contacting the raw coal gas at a temperature within the range of 700°–900° C. from which the tarry matter and hydrogen sulfide have been removed, with an ammonia decomposition catalyst to decompose and remove ammonia.

4,233,276
PROCESS FOR THE DESULFURIZATION OF WASTE GASES

Gerard J. D'Souza, Glen Ellyn, and Herschel D. Radford, Flossmoor, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Mar. 30, 1979, Ser. No. 25,377
Int. Cl.[2] B01D *53/34*
U.S. Cl. 423—230 7 Claims



1. A process for the removal of oxidizable sulfur compounds from a waste gas which process comprises:

(a) mixing a waste gas containing compounds oxidizable to sulfur oxides with molecular oxygen and oxidizing said compounds to sulfur oxides;

(b) contacting said waste gas with a metal oxide absorbent capable of absorbing sulfur oxides, at a temperature of between about 100° C. and 800° C., and absorbing sulfur oxides with said metal oxide absorbent;

(c) simultaneously, in the presence of a hydrocarbon cracking catalyst and at a temperature of between about 375° C. and about 1,200° C., cracking a hydrocarbon, regenerating the spent metal oxide absorbent; and contacting the absorbent with steam to form hydrogen sulfide and separating the hydrogen sulfide from cracked hydrocarbon products.

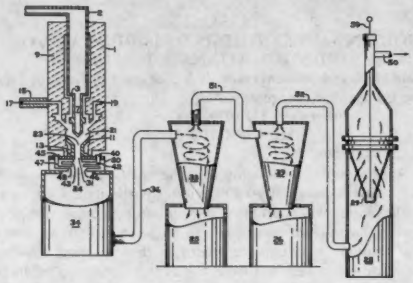
4,233,277
PREPARING REFRACTORY METAL BORIDE POWDER

Robert S. Sheppard, Doylestown, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Feb. 3, 1975, Ser. No. 546,837
Int. Cl.[2] C01B *35/04*
U.S. Cl. 423—297 17 Claims

1. In the process for preparing refractory metal boride powder selected from the borides of the metals titanium, zirconium and hafnium by gas phase reaction of the corresponding metal halide reactant and boron source reactant selected from the group consisting of boron halide and boron hydride in the presence of hydrogen in a reactor wherein said reactants are introduced into a reactant mixing zone through reactant inlet assembly means and reacted within the reactor to form solid refractory metal boride powder and wherein the metal boride powder tends to deposit and accumulate on the surfaces of the assembly means exposed to said reactants, the improvement which comprises establishing a hydrogen-containing gas stream in close proximity to but spaced from the exposed surfaces of the reactant inlet assembly means, introducing boron source reactant mixed with inert carrier gas into said hydrogen-containing gas stream, introducing metal halide reactant and substantially anhydrous hydrogen halide into said

hydrogen-containing gas stream upstream of the boron source reactant, the amount of hydrogen halide introduced being sufficient to retard growth of said metal boride powder on said



exposed surfaces of the assembly means, the heat content of the hydrogen-containing gas stream and reactants being sufficient to establish refractory metal boride forming temperatures in said reactor.

4,233,278

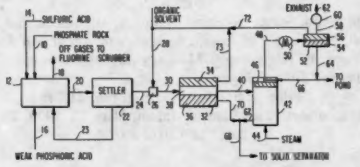
PROCESS FOR PURIFYING CRUDE PHOSPHORIC ACID

Joseph D. Korchnak, Lakeland, Fla., assignor to Davy Powergas Inc., Lakeland, Fla.

Filed Mar. 24, 1978, Ser. No. 889,985

Int. Cl.[2] C01B *25/22*

U.S. Cl. 423—321 S **5 Claims**



1. In a wet process for the production of phosphoric acid of improved purity whereby a phosphoric acid slurry containing both volatizable organic material and non-volatile extractable ingredients from phosphate rock is contacted with a liquid organic extractant which extracts said extractable ingredients, thereby providing an extraction phase, an aqueous acid phase and a phase consisting essentially of a heterogenous mixture of both extraction and acid phases, said heterogenous mixture phase containing both volatizable organic material and bindable non-volatile ingredients; the improvement which comprises:

separating the heterogenous mixture phase from the extraction and acid phases, and treating the separated heterogenous mixture phase under steam-stripping, volatile organic-removing conditions including atmospheric or subatmospheric pressures to steam-strip the mixture so as to provide an overhead containing steam and steam-stripped, volatized organic material, thereby removing volatile organic material from the mixture, and to also thereby bind said bindable non-volatile ingredients to enhance their separation from the heterogenous mixture phase by liquid-solid separation procedures.

4,233,279

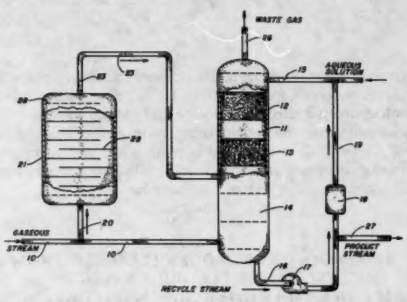
PROCESS FOR THE SYNTHESIS OF AMMONIUM NITRITE

Laszlo J. Balint; Lamberto Crescentini; William B. Fisher, all of Chester, and Muhammad S. Sahli, Richmond, all of Va., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Continuation-in-part of Ser. No. 881,453, Feb. 27, 1978, abandoned, which is a continuation-in-part of Ser. No. 790,526, Apr. 25, 1977, abandoned. This application Jun. 4, 1979, Ser. No. 44,878

Int. Cl.[3] C01B *21/50*

U.S. Cl. 423—385 **7 Claims**



1. In a process for producing ammonium nitrite by the absorption in a continuous gaseous phase absorption chamber of a gas containing nitric oxide, nitrogen dioxide, oxygen and at least 65 percent by volume of inert gas in an absorption system with an aqueous absorbing solution containing a basically reacting ammonium compound selected from the group consisting of ammonium carbonate, ammonium bicarbonate, ammonium hydroxide and mixtures thereof, employing entering gas with at least 2.0 mol ratio of nitric oxide:nitrogen dioxide and employing absorbing solution having normality of at least 0.1 with respect to the basically reacting ammonium compound, the improvement which comprises:

(a) maintaining the absorption system at a pressure of 5 to 25 psig;

(b) adding supplemental nitrogen dioxide to said gas being absorbed in the absorption system, said supplemental nitrogen dioxide being added to said gas when the absorption of nitrogen oxides is 50 to 99 percent complete based on the nitrogen oxides in the entering gas, said supplemental nitrogen dioxide being added to said gas in amount sufficient to provide a nitrogen dioxide:nitric oxide mol ratio between 1 and 4 in the resulting mixture, whereby nitrogen oxide emission as vent gas from the absorption system is significantly reduced.

4,233,280

MANUFACTURE OF ANHYDROUS HYDROGEN CHLORIDE BY COMBUSTING CHLORINE-CONTAINING ORGANIC SUBSTANCES

Jan Langens, Kalmthout, and Guido Devroe, Kapellen, both of Belgium, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 10, 1979, Ser. No. 28,737

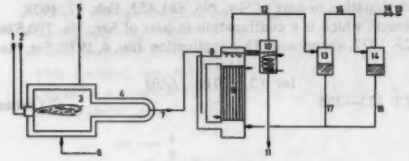
Claims priority, application Fed. Rep. of Germany, Jun. 24, 1978, 2827761

Int. Cl.[3] C01B *7/08*

U.S. Cl. 423—481 **3 Claims**

1. A process for obtaining anhydrous hydrogen chloride from chlorine-containing organic residues by combusting these in an oxygen-containing atmosphere and separating the hydrogen chloride from the water formed during combustion, wherein the combustion of the organic residues, in which the

weight ratio of hydrogen and chlorine is greater than 0.028, is carried out in an atmosphere containing more than 80% by volume of oxygen, at pressures of from 1 to 100 bar and at above 2,000° C., the combustion products are cooled to from 200° to 800° C. and are then passed into a first cooling zone which contains a solution of hydrogen chloride in water, the



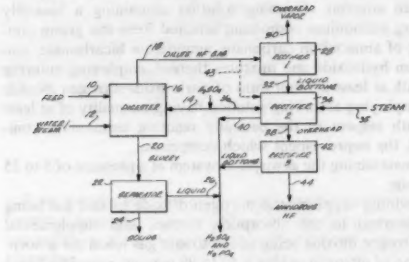
mixture of water, hydrogen chloride and the other combustion products is cooled to from 10° to 80° C., the gaseous mixture which contains hydrogen chloride and carbon dioxide is then discharged from the first cooling zone and cooled to from −40° C. to 0° C. in a second cooling zone, and is separated from the aqueous hydrochloric acid which condenses and is discharged from the second cooling zone.

4,233,281

RECOVERY OF HYDROGEN FLUORIDE FROM METALLIC FLUORIDE SALTS

Ronald J. Hirko, and Harold E. Mills, both of Lake City, Fla., assignors to Occidental Chemical Company, Houston, Tex.

Filed Jun. 9, 1978, Ser. No. 914,130
Int. Cl.[2] C01B 7/19
U.S. Cl. 423—484 **54 Claims**



13. In a method for recovering hydrogen fluoride containing phosphate values, reported by analysis as P_2O_5, from a metallic fluoride salt mixture comprising at least about 7% by weight, on a dry basis, fluorine and analyzing to contain from about 4% to about 25% by weight, on a dry basis, P_2O_5, the method comprising the steps of:

introducing such metallic fluoride salt mixture and sulfuric acid in an amount in excess of that required for reaction with the metallic fluoride salt mixture into a digestion stage maintained at an elevated temperature sufficient for reaction therein of the metallic fluoride salt mixture with sulfuric acid and reacting the sulfuric acid with the metallic fluoride salt mixture to release a gas comprising hydrogen fluoride and phosphate values and produce a slurry comprising a residual liquid including introduced unreacted sulfuric acid and residual solids resulting from reaction of the metallic fluoride salt mixture with sulfuric acid; and

withdrawing the released gas and slurry from the digestion zone, the improvement comprising the steps of:

introducing water to the digestion zone; and

maintaining the concentration of water and sufficient excess unreacted sulfuric acid in the digestion zone such that the released gas comprising hydrogen fluoride withdrawn from the digestion zone is substantially free of phosphate values and has a weight ratio of hydrogen fluoride to P_2O_5 of greater than 100.

4,233,282

MOLTEN SALT SYNTHESIS OF BARIUM AND/OR STRONTIUM TITANATE POWDER

Ronald H. Arendt, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 18, 1979, Ser. No. 85,924
Int. Cl.[3] C01G 23/00
U.S. Cl. 423—598 **6 Claims**

1. A process for producing alkaline earth titanate powder which consists essentially of providing particulate TiO_2 in at least stoichiometric amount or particulate precursor therefor, providing particulate alkaline earth oxide in at least stoichiometric amount or particulate precursor therefor, said alkaline earth oxide being selected from the group consisting of BaO, SrO, and mixtures thereof, providing an alkali chloride salt selected from the group consisting of sodium chloride, potassium chloride and mixtures thereof, forming a mixture of said TiO_2 or precursor therefor, said alkaline earth oxide or precursor therefor and said chloride salt solvent, said chloride salt being used in an amount of at least about 20% by weight of the total amount of said TiO_2, alkaline earth oxide and said chloride salt, heating said mixture to a reaction temperature at least sufficient to melt said chloride salt, each said precursor decomposing completely at or below said reaction temperature to form said oxide and by-product gas, said chloride salt in molten form being a solvent for said TiO_2 and alkaline earth oxide, maintaining said reaction temperature dissolving and reacting said TiO_2 and alkaline earth oxide in said molten salt and precipitating said alkaline earth titanate, and recovering said precipitated alkaline earth titanate by dissolving said chloride salt and separating said precipitated alkaline earth titanate from the resulting salt solution.

4,233,283

METHOD FOR MANUFACTURE OF IRON OXIDE FLAKES

Kazuaki Ado, Sakai; Soichiro Nobuoka, Toyonaka, and Takashi Asai, Minoo, all of Japan, assignors to Agency of Industrial Science & Technology, Ministry of International Trade & Industry, Tokyo, Japan

Filed Mar. 15, 1979, Ser. No. 21,241
Claims priority, application Japan, May 20, 1978, 53-60193
Int. Cl.[3] C01G 49/06
U.S. Cl. 423—633 **4 Claims**

1. In a method for the manufacture of micaceous α-iron oxide by the steps of mixing an aqueous ferric salt solution with an aqueous alkali solution thereby producing an amorphous precipitate and subjecting the precipitate to a hydrothermal treatment at a temperature of more than 150° C. under pressure of more than 5 kg/cm^2, the improvement which comprises the step of adding boric acid or a salt thereof in an amount of 0.1 to 10% by weight, based on the ferric salt computed as an anhydride, prior to the hydrothermal treatment.

4,233,284

STABILIZED RADIOGRAPHIC SCANNING AGENTS

Mahdi B. Fawzi, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Mar. 31, 1978, Ser. No. 892,245
Int. Cl.[2] A61K 29/00, 43/00
U.S. Cl. 424—1 **22 Claims**

21. A method of preparing a stabilized technetium-99m-based scanning agent, comprising codissolving a stabilizing amount of a gentisate stabilizer selected from gentisic acid or a pharmaceutically-acceptable salt or ester thereof with an aqueous solution of radioactive technetium in the +3, +4 or +5 valence state.

4,233,285

MERCAPTOCARBOXYLIC ACID RADIOPHARMACEUTICALS

Harry S. Winchell, Lafayette, and Tz-Hong Lin, Berkeley, both of Calif., assignors to Medi-Physics, Inc., Emeryville, Calif.

Filed May 14, 1973, Ser. No. 359,719

The portion of the term of this patent subsequent to Jun. 17, 1997, has been disclaimed.

Int. Cl.[2] A61K *29/00, 43/00*

U.S. Cl. 424—1 9 Claims

1. A radiopharmaceutical comprising a complex of a mercaptocarboxylic acid chelating agent having at least one carboxylic acid group and at least one mercapto group with a radioactive heavy metal ion produced by reduction with stannous chloride in the presence of the chelating agent wherein said complex is formed at a pH of from about 2 to 4 and the mole ratio of said metal chelating agent to stannous chloride present to reduce such metal ion is about three to one.

4,233,286

LOW AFFINITY IGM-LATEX PARTICLES AND ASSAY THEREWITH FOR IMMUNE COMPLEXES

John F. Soothill, and Roland J. Levinsky, both of London, England, assignors to National Research Development Corporation, London, England

Filed Sep. 9, 1977, Ser. No. 831,872

Claims priority, application United Kingdom, Aug. 31, 1977, 36364/77

Int. Cl.[2] G01N *21/00, 23/00, 31/00, 33/16*

U.S. Cl. 424—12 14 Claims

1. A method for the estimation of a human immune complex and analysis of an antibody constituent thereof comprising a latex particle agglutination test, in which a sample containing human immune complex is incubated with latex particles coated with low affinity IgM antibodies raised in a non-human animal against said human anitbody constituent.

7. A latex particle product coated with immunoglobulins consisting of low affinity IgM antibodies raised in a non-human animal against a human antibody.

4,233,287

SYNTHETIC RESIN-BASE, ANTIBIOTIC COMPOSITIONS CONTAINING AMINO ACIDS

Dietrich Heusser, and Elvira Dingeldein, both of Darmstadt, Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

Division of Ser. No. 845,703, Oct. 26, 1977. This application Oct. 9, 1979, Ser. No. 82,455

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1976, 2651441; Jun. 18, 1977, 2727535

The portion of the term of this patent subsequent to Mar. 4, 1997, has been disclaimed.

Int. Cl.[3] A61K *31/78, 9/70;* A61F *13/00;* A61L *15/03*

U.S. Cl. 424—14 11 Claims

1. A pharmaceutical composition in the form of individual particles of a base of polymethacrylate, polyacrylate or a mixture thereof, connected together at least partially via filaments or wires, the particles further comprising at least one antibiotic in antimicrobial amounts and an antibiotic-liberating agent wherein the antibiotic-liberating agent consists essentially of at least one amino acid.

4,233,288

GUM EMULSIFIED LIQUID PACKAGE FOR DELIVERING AND PRESERVING LIQUID CONTENT IN THE MOUTH

John A. Cornell, 32nd and Spring Garden Sts., Philadelphia, Pa. 19104

Filed Mar. 12, 1979, Ser. No. 19,639

Int. Cl.[3] A61K *9/68*

U.S. Cl. 424—48 8 Claims

1. A chewing gum emulsified liquid composition for maintaining and adding to the liquid content in the mouth to ameliorate xerostoma and add mineral salts and water comprising:

from 40 to 62 parts water containing dissolved mineral salts, including sodium, potassium, calcium and magnesium chlorides, and potassium phosphates at a concentration of from 1% to 3% of the water constituting the dispersed phase;

from about 25 to 35 parts hydrophobic chewing gum base selected from the class consisting of gum chicle and SBR synthetic rubber gum as the dispersed phase;

from 2 to 2000 parts per million fluoride ions based on sodium fluoride, stannous fluoride or sodium fluorophosphate;

from about 3 to 6 parts by weight of water soluble carbohydrate sweetener which is dissolved in the mineral salt water solution;

from 1% to 3% glycerine to augment the liquid phase;

an emulsifier in a concentration of 0.1% to 1.0%;

from about 4% to 5% of a finely divided filler selected from the class consisting of cellulose fibrous filler, CMC and calcium phosphate filler.

4,233,289

3-PYRIDYLMETHYLTHIOCARBAMATES

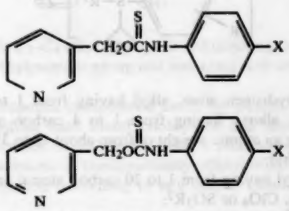
Edward E. Kilbourn, Chalfont; Ernest D. Weiler, Ambler, and William D. Weir, Levittown, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 591,581, Jun. 30, 1973. This application Jan. 31, 1979, Ser. No. 8,296

Int. Cl.[3] A01N *431/40;* C07D *213/59*

U.S. Cl. 424—84 11 Claims

1. A rodenticidal composition which comprises an inert carrier and as the active ingredient a compound of the formula



wherein X is cyano, nitro, mercapto, (C_1-C_6)alkylthio, (C_1-C_6)alkylsulfinyl, (C_1-C_6)alkylsulfonyl or (C_1-C_6)alkylsulfamyl; and the strong acid addition salts thereof.

4,233,290

METHOD OF TREATING DOMESTIC ANIMALS

Lorenzo Ferrari; Ernani Dell'Acqua, and Giorgio Quaglia, all of Milan, Italy, assignors to SPA-Societa Prodotti Antibiotici, S.p.A., Milan, Italy

Filed Mar. 1, 1979, Ser. No. 16,616

Int. Cl.[3] A61K *37/48;* A23C *9/12*

U.S. Cl. 424—94 10 Claims

1. A method of treating domestic animals endangered by or suffering from vaccination stress, wherein a member selected from the group consisting of lysozyme and non-toxic salts of lysozyme is administered to a domestic animal endangered by or suffering from vaccination stress in amounts effective to counteract the effects of such vaccination stress.

4,233,291

NOVEL BIOLOGICAL SUBSTANCE FROM A FUNGUS AND THE PROCESS FOR PRODUCING THE SAME

Nicole Simon-Lavoine, Neuilly, and Marcel Forgeot, Paris, both of France, assignors to Science Union et Cie, Suresnes, France

Filed Nov. 27, 1978, Ser. No. 964,071

Claims priority, application France, Nov. 30, 1977, 77 36000

Int. Cl.[3] A61K *37/00;* **C07C** *103/52;* **C12P** *21/00*

U.S. Cl. 424—177 **17 Claims**

1. A mixture of peptidolic substances obtained from the mycelium of Fusarium equiseti, said mixture being separable into four components by high pressure liquid chromatography, said components being designated A, B, C & D, said mixture, on acidic hydrolysis yielding α-hydroxy iso valeric acid and N-methyl Valine; N-methyl isoleucine and N-methyl allo iso leucine, and on alkaline hydrolysis yielding the lactone of α hydroxy isovaleroyl N-methyl Valine, the lactone of α-hydroxy isovaleroyl N-methyl isoleucine and the lactone of α-hydroxy iso valeroyl N-methyl allo iso leucine.

4,233,292

CYCLOPROPYL SULFONIUM SALTS

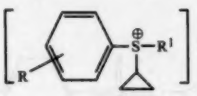
Faizulla G. Kathawala, West Orange, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Filed Feb. 7, 1979, Ser. No. 10,016

Int. Cl.[3] A61K *31/69, 31/095;* **C07C** *147/00*

U.S. Cl. 424—185 **3 Claims**

1. A method of treating obesity in a mammal in need of such treatment, which comprises administering to said mammal an obesity treating effective amount of a compound of the formula:



wherein

R is a hydrogen atom, alkyl having from 1 to 4 carbon atoms, alkoxy having from 1 to 4 carbon atoms, halo having an atomic weight of from about 19 to 35 or trifluoromethyl;

R^1 is alkyl having from 1 to 20 carbon atoms; and

Z is BF_4, ClO_4 or SO_3R^2;

wherein R^2 is methyl, phenyl, p-tolyl, or 2-naphthyl.

4,233,293

INSECTICIDAL AND ACARICIDAL O-ALKYL-O-[1-(2-CYANOALKYL)-5-HALO-1,2,4-TRIAZOL(3)YL]-(THIONO)(THIOL)-PHOSPHORIC(-PHOSPHONIC) ACID ESTERS AND ESTER-AMIDES

Rainer A. Fuchs, Wuppertal; Ingeborg Hammann, Cologne, and Wolfgang Behrenz, Overath-Steinenbrueck, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

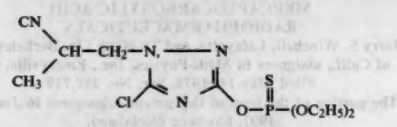
Filed Apr. 26, 1976, Ser. No. 680,408

Claims priority, application Fed. Rep. of Germany, May 14, 1975, 2521400

Int. Cl.[3] A01N *57/16, 57/32;* **C07F** *9/65*

U.S. Cl. 424—200 **3 Claims**

1. The compound O,O-diethyl-O-[1-(2-cyanopropyl)-5-chloro-1,2,4-triazol(3)yl]-thionophosphoric ester of the formula



2. An insecticidal or acaricidal composition containing as active ingredient an insecticidally or acaricidally effective amount of a compound according to claim 1 in admixture with a diluent.

4,233,294

METHOD OF COMBATTING *PLUTELLA MACULIPENNIS* WITH O-ISOPROPYL-S-[5-BROMO-PYRIMIDIN-2-YL]-THIONOTHIOL-METHANE-PHOSPHONIC ACID

Fritz Maurer, Wuppertal; Ingeborg Hammann, Cologne, and Wolfgang Behrenz, Overath, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

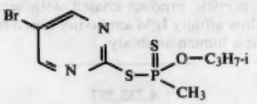
Filed Dec. 21, 1978, Ser. No. 971,780

Claims priority, application Fed. Rep. of Germany, Jan. 14, 1978, 2801584

Int. Cl.[3] A01N *57/16;* **C07F** *9/65*

U.S. Cl. 424—200 **1 Claim**

1. A method of combating Plutella maculipennis which comprises applying thereto or to a habitat thereof an arthropodicidally effective amount of O-isopropyl-S-[5-bromo-pyrimidin-2-yl]-thionothiol-methane-phosphonic acid ester of the formula



4,233,295

CORTICOSTEROID FORMULATIONS CONTAINING SEBACATE CARRIER

John A. Hill, New Brunswick; Yu-chang J. Wang, and Thomas M. Wong, both of North Brunswick, all of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed May 31, 1979, Ser. No. 43,989

Int. Cl.[3] A01N *45/00;* **A61K** *31/56*

U.S. Cl. 424—238 **16 Claims**

1. A steroid composition in the form of an ointment, gel, lotion, cream or solution which is useful in treating dermatitis, consisting essentially of an effective amount of from about 0.001 to about 3% by weight of a corticosteroid and a dialkyl sebacate in an amount of from about 5 to about 75% by weight of the composition, the corticosteroid being dissolved in the dialkyl sebacate.

4,233,296

11β-SUBSTITUTED-$\Delta^{4,9}$-ESTRADIENES

Jean G. Teutsch, Le Blanc-Mesnil, and Daniel Philibert, La Varenne Saint-Hilaire, both of France, assignors to Roussel Uclaf, Paris, France

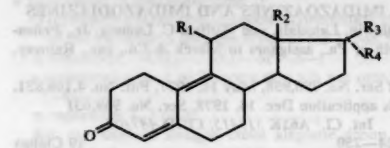
Filed Jan. 6, 1978, Ser. No. 867,485

Claims priority, application France, Jan. 13, 1977, 77 00858

Int. Cl.[2] A61K *31/58, 31/56;* **C07J** *17/00, 1/00*

U.S. Cl. 424—241 **32 Claims**

1. A compound of the formula



wherein R_1 is linear or branched alkyl of 1 to 12 carbon atoms, unsaturated alkyl of 2 to 8 carbon atoms optionally substituted with a member selected from the group consisting of alkylthio of 1 to 4 carbon atoms and halogens aryl of 6 to 12 carbon atoms and aralkyl of 7 to 13 carbon atoms optionally substituted with at least one member of the group consisting of alkyl and alkoxy of 1 to 4 carbon atoms, halogen and $—CF_3$ and a heterocycle selected from the group consisting of thienyl, isothienyl and furyl, R_2 is alkyl of 1 to 4 carbon atoms, R_3 is selected from the group consisting of hydrogen, hydroxy, acyloxy of an organic carboxylic acid of 1 to 18 carbon atoms, alkoxy of 1 to 8 carbon atoms and acyl of an organic carboxylic acid of 1 to 18 carbon atoms and R_4 is selected from the group consisting of hydrogen, hydroxy, alkyl and alkoxy of 1 to 8 carbon atoms, alkenyl and alkynyl of 2 to 8 carbon atoms and acyloxy of an organic carboxylic acid of 1 to 18 carbon atoms, with the proviso that R_4 is not hydrogen when R_1 is allyl, R_2 is methyl and R_3 is hydroxy.

15. A progestomimetic composition comprising a progestomimetically effective amount of at least one compound of claim **1** and an inert pharmaceutical carrier.

29. A method of inducing progestomimetic activity in warm-blooded animals comprising administering to warm-blooded animals a progestomimetically effective amount of at least one compound of claim **1**.

4,233,297

NOVEL Δ^4-ANDROSTENES

Jean G. Teutsch, Pantin, and Roger Deraedt, Les Pavillons-sous-Bois, both of France, assignors to Roussel Uclaf, Paris, France

Filed Jun. 27, 1979, Ser. No. 52,489

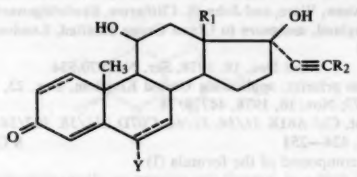
Claims priority, application France, Jul. 13, 1978, 78 20971

The portion of the term of this patent subsequent to Sep. 18, 1996, has been disclaimed.

Int. Cl.[3] **A61K** *31/56*

U.S. Cl. 424—243 **30 Claims**

1. Δ^4-androstenes of the formula



wherein R_1 is alkyl of 1 to 3 carbon atoms, Y is selected from the group consisting of hydrogen, fluorine and methyl, R_2 is selected from the group consisting of saturated and unsaturated alkyl of 1 to 12 carbon atoms, $—CF_3$, aryl of 6 to 12 carbon atoms and aralkyl of 7 to 12 carbon atoms and the dotted lines in the A and B rings indicate the optional presence of one or two double bonds in the 1(2) and 6(7) positions with the proviso that when R_1 is methyl, R_2 is saturated or unsaturated alkyl and the B ring is saturated, Y is methyl.

22. A method of treating inflammation in warm-blooded animals comprising administering to warm-blooded animals an anti-inflammatorily effective amount of at least one compound of claim **1**.

4,233,298

ESTERS OF P-CARBONYLPHENOXY-ISOBUTYRIC ACIDS

Andre Mieville, Lausanne, Switzerland, assignor to Orchimed SA, Switzerland

Division of Ser. No. 600,127, Jul. 29, 1975, Pat. No. 4,058,552, which is a continuation-in-part of Ser. No. 326,188, Jan. 24, 1973, Pat. No. 3,907,792, which is a continuation-in-part of Ser. No. 8,071, Feb. 2, 1970, Pat. No. 3,914,286. This application Sep. 1, 1977, Ser. No. 829,964

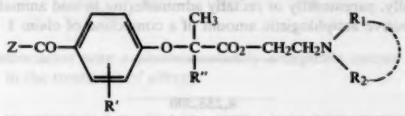
Claims priority, application Switzerland, Jan. 31, 1969, 1517/69; Aug. 28, 1969, 13022/69

Int. Cl.[3] **C07C** *93/20, 147/07, 149/43;* **C07D** *295/14*

U.S. Cl. 424—244 **11 Claims**

1. A novel ester of p-carbonylphenoxy-isobutyric acid selected from the group consisting of

(a) compounds of the formula



wherein

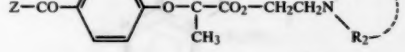
R' is H, CH_3, C_6H_5, SCH_3, OCH_3, or SO_2CH_3;

R" is CH_3 or C_2H_5;

Z is a phenyl group substituted by one halogen atom and NR_1R_2 is $N(CH_3)_2$, $N(C_2H_5)_2$, morpholino, piperidino, hexamethylenimino or pyrrolidino, and

(b) non-toxic acid addition salt thereof.

3. A novel ester of p-carbonylphenoxy-isobutyric-acid having the formula



wherein Z is C_1–C_4 alkyl, phenyl or chlorophenyl and NR_1R_2 is a hexamethylenimino group and non-toxic acid addition salts thereof.

10. A therapeutic composition useful for treating patients in order to reduce their blood cholesterol and lipids content, which comprises, in association with a pharmaceutically acceptable excipient, a therapeutically effective amount of at least a compound according to any one of claims **1**, **2**, **3** or **6–11**.

4,233,299

4-HYDROXY-2H-1,2-BENZOTHIAZINE-3-CARBOXAMIDE-1,1-DIOXIDES AND SALTS THEREOF

Günter Trummlitz; Wolfhard Engel; Ernst Seeger, and Günther Engelhardt, all of Biberach an der Riss, Fed. Rep. of Germany, assignors to Boehringer Ingelheim GmbH, Fed. Rep. of Germany

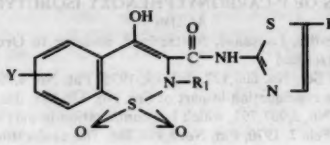
Filed Dec. 6, 1978, Ser. No. 966,963

Claims priority, application Fed. Rep. of Germany, Dec. 16, 1977, 2756113

Int. Cl.[3] **C07D** *417/12;* **A61K** *31/38*

U.S. Cl. 424—246 **5 Claims**

1. A compound of the formula



wherein

R_1 is hydrogen, methyl or ethyl;

R_2 is methyl, ethyl or n-propyl; and

Y is hydrogen, methyl, methoxy, fluorine or chlorine or a non-toxic, pharmacologically acceptable salt thereof formed with an inorganic or organic base.

5. The method of counteracting inflammation and fever in a warm-blooded animal in need thereof, which comprises perorally, parenterally or rectally administering to said animal an effective antiphlogistic amount of a compound of claim **1**.

4,233,300

8H-PYRAZOLO[1,5-A]PYRAZOLO[4',3':5,6]PYRIDO[3,4-E]PYRIMIDINE

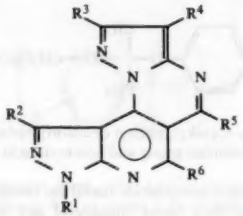
Theodor Denzel, Regensburg, and Hans Hoehn, Tegernheim, both of Fed. Rep. of Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 679,121, Apr. 21, 1976. This application Nov. 13, 1979, Ser. No. 93,641

Int. Cl.[3] **C07D** *471/22;* **A61K** *31/415, 31/505*

U.S. Cl. 424—248.4 **10 Claims**

1. A compound of the formula



wherein R^1 is hydrogen, lower alkyl, phenyl, phenyl-lower alkylene, benzoyl or substituted benzoyl wherein the benzoyl substituent is one or two halogens, lower alkyl or trifluoromethyl groups;

R^2 and R^3 each is hydrogen, lower alkyl or phenyl;

R^4 is hydrogen, lower alkyl, phenyl, carboxy or lower alkoxycarbonyl;

R^5 is;

R^6 is hydrogen or lower alkyl;

R^7 and R^8 together with the nitrogen form one of the unsubstituted or substituted heterocyclics pyrrolidino, morpholino, thiamorpholino, piperidino, pyrazolyl, dihydropyridazinyl or piperazinyl wherein the heterocycle substituent is lower alkyl or hydroxy-lower alkyl;

and acid addition salts thereof.

9. A composition comprising about 10 to 300 mg of a compound of claim **1** and a physiologically acceptable carrier therefor.

4,233,301

NOVEL IMIDAZOAZINES AND IMIDAZODIAZINES

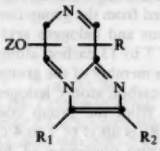
John J. Baldwin, Lansdale, and William C. Lumma, Jr., Pennsburg, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 796,958, May 16, 1977, Pat. No. 4,166,851. This application Dec. 14, 1978, Ser. No. 969,631

Int. Cl.[3] **A61K** *31/415;* **C07D** *487/04*

U.S. Cl. 424—250 **19 Claims**

1. Compounds having the formula



and pharmaceutically acceptable salts thereof wherein

Z is $—CH_2—CHOR_3—CH_2—NHR_4$ wherein R is H or C_2–C_{12} acyl selected from alkanoyl, benzoyl, naphthoyl, methylbenzoyl and phenylbenzoyl and R_4 is C_1–C_{12}alkyl,

R is H, $—SCF_3$, —CN, halogen, C_1-$_6$alkyl, NH_2, C_1–C_6 haloalkyl, C_1–C_{12}acyl, of the formula

wherein L is H, alkyl or aryl, phenyl, $—COOR_5$ wherein R_5 is H C_1-C_6alkyl or C_6–C_{12} carbocyclic aryl, $—CONR_6R_7$ wherein R_6 and R_7 when separate, are H or C_1-C_6alkyl and when joined, are $—CH_2—(CH_2)_3—CH_2$, $—CH_2—CH_2—O—CH_2—CH_2—$, $—CH_2—CH_2—N-H—CH_2—CH_2—$, or $—CH_2—CH_2—N(CH_3)—CH-_2—CH_2—$, $—C_1$-C_6alkylthio, C_1–C_6 alkylsulfinyl or C_1-C_6alkylsulfony, and

R_1 and R_2 when separate are R and when joined are $—(CH_2)_n—$ wherein n is 3, 4 or 5.

19. A pharmaceutical composition for effecting β-adrenergic blockade containing an effective amount of a compound of claim **1**.

4,233,302

AMINE DERIVATIVES AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Michael Martin-Smith; Barry J. Price, both of Hertford; John Bradshaw, Ware, and John W. Clitherow, Sawbridgeworth, all of England, assignors to Glaxo Group Limited, London, England

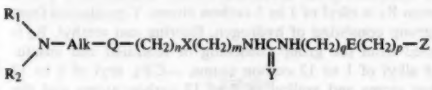
Filed Dec. 18, 1978, Ser. No. 970,534

Claims priority, application United Kingdom, Dec. 23, 1977, 53716/77; Nov. 16, 1978, 44778/78

Int. Cl.[3] **A61K** *31/34, 31/44;* **C07D** *213/58, 307/54*

U.S. Cl. 424—251 **8 Claims**

1. A compound of the formula (I)



or a physiologically acceptable salt, N-oxide or hydrate thereof, in which Y represents =O, =S, $=CHNO_2$ or $=NR_3$ where R_3 represents hydrogen, nitro, cyano, lower alkyl, aryl, lower alkyl sulphonyl or aryl sulphonyl; R_1 and R_2, which may be the same or different each represents hydrogen, lower alkyl, cycloalkyl, lower alkenyl, aralkyl, hydroxy, lower trifluoroalkyl, lower alkyl substituted by hydroxy, lower alkoxy, amino, lower alkylamino or lower dialkylamino, or R_1 and R_2 to-

gether with the nitrogen atom to which they are attached form a pyrrolidine or piperidine ring;

Q represents a furan ring in which incorporation into the rest of the molecule is through bonds at the 2- and 5-positions;

X represents $-CH_2-$, $-O-$ or $-S-$;

n represents zero, 1 or 2 except that n is not zero when X is $-O-$;

m represents 2, 3 or 4;

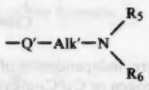
Alk represents a straight chain alkylene group of 1 to 3 carbon atoms;

q represents 2, 3 or 4 or can additionally represent zero or 1 when E is a $-CH_2-$ group;

p represents zero, 1 or 2;

E represents $-CH_2-$, $-O-$ or $-S-$; and

Z represents a phenyl ring optionally substituted by at least one of lower alkyl, hydroxy, lower alkyl hydroxy, amino, lower alkoxy or halo or a furyl, thienyl, pyridyl, imidazolyl, thiazolidinyl, oxazolidinyl or pyrimidinyl ring optionally substituted by lower alkyl optionally substituted by hydroxy or halo or Z represents the group



where Q' represents a 2,5-furan or thiophen ring or 1,3- or 1,4-benzene ring;

Alk' represents any of the groups defined for Alk; and R_5 and R_6, which may be the same or different, each represent any of the groups defined for R_1 and R_2; except that p is not zero when E is oxygen and Q' or Z is a furan or thiophen ring system.

8. A method of treating a condition mediated through histamine H_2-receptors which comprises administering to a patient an effective amount of a compound as defined in claim 1 to relieve said condition.

4,233,303

XANTHINE DERIVATIVES

Sten H. A. M. Bergstrand, Bjärred; Per G. Kjellin, Lund; Carl G. A. Persson, Löberöd, and Lars M. Sorenby

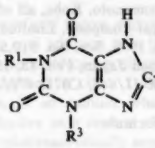
Filed Sep. 29, 1978, Ser. No. 947,002

Claims priority, application Sweden, Oct. 14, 1977, 7711581

Int. Cl.³ C07D *473/08*

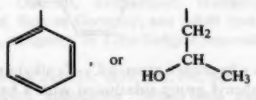
U.S. Cl. 424—253 **12 Claims**

1. A compound of the formula

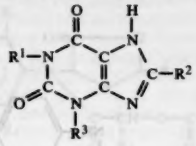


(I)

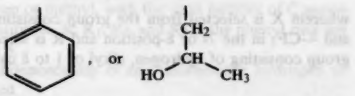
or a physiologically acceptable salt thereof, in which formula R^1 is methyl, ethyl or n-propyl, R_2 is methyl or n-propyl and R_3 is



7. A pharmaceutical preparation comprising as active ingredient an antianaphylactic effective amount of a compound of the formula



or a physiologically acceptable salt or an optical isomer thereof, in which formula R^1 is methyl, ethyl or n-propyl, R^2 is methyl or n-propyl and R^3 is



in association with a pharmaceutically acceptable carrier for use in the treatment of allergy.

4,233,304

PYRIDOXINE DERIVATIVES

Alberto Reiner, Como, Italy, assignor to Crinos Industria Farmacobiologica S.p.A., Italy

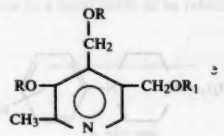
Filed Jul. 3, 1979, Ser. No. 54,613

Claims priority, application Italy, Jul. 31, 1978, 26327 A/78; May 23, 1979, 22932 A/79

Int. Cl.³ C07D *213/30*; A61K *31/44*

U.S. Cl. 424—256 **8 Claims**

1. Pyridoxine derivative of the formula



(I)

wherein

each of the R groups represents a hydrogen atom or taken together represent an isopropylidene group and R_1 represents a moiety selected from the group consisting of 2-hydroxybenzoic acid, 4-allyloxy-3-chlorophenylacetic acid, or 2-(4-isobutylphenyl)-propionic acid, and their addition salts with inorganic and organic, physiologically acceptable, acids.

7. Anti-inflammatory pharmaceutical composition for oral, parenteral, rectal administration or for topical application, characterized in that it contains an anti-inflammatory effective amount of at least one derivative of formula (I) according to claim 1, or a physicologically acceptable acid addition salt thereof, combined with conventional pharmaceutical carriers, vehicles, additives, fillers and/or stabilizers.

4,233,305

NOVEL DERIVATIVES OF 2-(4-QUINOLINYLAMINO)-5-FLUORO-BENZOIC ACIDS

Andre Allais, Gagny; Jean Meier, La Varenne Saint-Hilaire, and Roger Deraedt, Les Pavillons-sous-Bois, all of France, assignors to Roussel Uclaf, Paris, France

Filed Dec. 6, 1978, Ser. No. 966,964

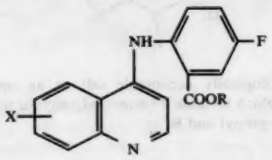
Claims priority, application France, Dec. 15, 1977, 77 37835; Dec. 15, 1977, 77 37836

Int. Cl.³ A61K *31/47*; C07D *215/44*

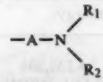
U.S. Cl. 424—258 **21 Claims**

1. A compound selected from the group consisting of 2-(4-

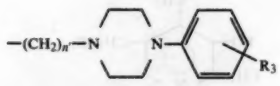
quinolinylamino)-5-fluoro-benzoic acid compounds of the formula



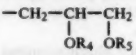
wherein X is selected from the group consisting of chlorine and $-CF_3$ in the 7- or 8-position and R is selected from the group consisting of hydrogen, alkyl of 1 to 8 carbons,



wherein A is branched alkylene of 3 to 5 carbon atoms or $-(CH_2)_n-$ and n is a number of 2 to 5 and R_1 and R_2 are individually alkyl of 1 to 8 carbon atoms or together with the nitrogen atom to which they are attached form a heterocyclic selected from the group consisting of piperidinyl, pyrrolidinyl, morpholinyl and N-piperazinyl optionally substituted on the second nitrogen atoms with alkyl of 1 to 4 carbon atoms,



with R_3 being selected from the group consisting of hydrogen, halogen, $-CF_3$, $-SCF_3$, $-OCF_3$ and alkyl and alkoxy of 1 to 8 carbon atoms in the 2,3- or 4-position, n' is 2 to 5 and



and R_4 and R_5 are both hydrogen or form a ketonide of the formula

and P and Q are alkyl of 1 to 8 carbon atoms, phenylalkyl of 7 to 13 carbon atoms or phenyl, alkali metals, alkaline earth metals, ammonium and non-toxic, pharmaceutically acceptable organic amines and their non-toxic, pharmaceutically acceptable acid addition salts.

8. An analgesic composition comprising an analgesically effective amount of at least one compound of claim 1 and an excipient.

4,233,306

1-IMINOMETHYLENE-SUBSTITUTED 2-(PHENOXY-ALKYL)-2-IMIDOAZOLINE DERIVATIVES

Manfred Böger, Weil am Rhein, Fed. Rep. of Germany; Jozef Drabek, Oberwil, Switzerland; Günter Mattern, Liestal, Switzerland, and Walter Traber, Reinach, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

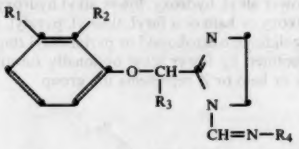
Filed Aug. 3, 1979, Ser. No. 63,239

Claims priority, application Switzerland, Aug. 14, 1978, 8631/78; Mar. 8, 1979, 2250/79; Jul. 3, 1979, 6194/79

Int. Cl.[3] **C07D** *233/22, 401/12, 417/12*

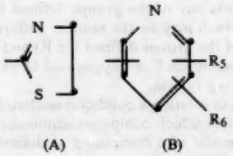
U.S. Cl. 424—263 **10 Claims**

1. A compound of the formula I



(I)

wherein R_1 and R_2 are, independently of each other, chlorine or methyl, R_3 is hydrogen or C_1–C_4-alkyl and R_4 is cyano or a group of the formula A or B



(A) (B)

wherein R_5 and R_6 are, independently of each other, hydrogen or methyl, and the acid addition salts thereof.

4,233,307

SPIRO-4'-PIPERIDINE COMPOUNDS AND THEIR PHARMACEUTICAL COMPOSITIONS

Keiichi Ono, Osaka; Kikuo Sasajima, Saitama; Junki Katsube, Toyonaka, and Hisao Yamamoto, Kobe, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

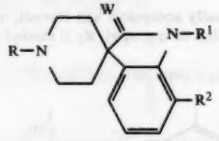
Filed May 30, 1978, Ser. No. 910,537

Claims priority, application Japan, Feb. 13, 1978, 53/15778

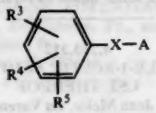
Int. Cl.[3] **A61K** *31/445;* **C07D** *471/10*

U.S. Cl. 424—267 **12 Claims**

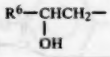
1. A compound of the formula



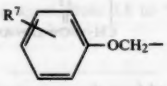
wherein R^1 is a hydrogen atom, a C_1–C_4 alkyl group, a phenyl group, or a phenyl group substituted with a halogen atom, a C_1–C_4 alkyl group or a C_1–C_4 alkoxy group, R^2 is a hydrogen atom, or R^1 and R^2, when taken together, may form a C_1–C_4 alkylene group, W is an oxygen atom or two hydrogen atoms and R is selected from the group consisting of the formula:



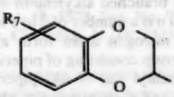
wherein A is a C_1–C_4 alkylene group, X is a carbonyl group, an oxygen atom, a single bond linkage, the formula >CH—OH or the formula —CH=CH— and R^3, R^4 and R^5 are each independently hydrogen, methyl, ethyl, isopropyl, butyl, methoxy, ethoxy, isopropoxy, halogen, hydroxy or benzyloxy, provided that when any one of R^3, R^4 and R^5 is benzyloxy, the other two are hydrogen, and the formula:



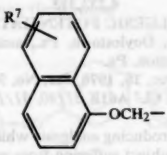
wherein R^6 is a group of the formula:



wherein R^7 is a hydrogen atom, a halogen atom, a nitrile group, a C_1–C_4 alkyl group, a C_1–C_4 alkoxy group or a hydroxy group,



wherein R^7 is as defined above, or



wherein R^7 is as defined above, and the non-toxic pharmaceutically acceptable acid addition salts thereof.

12. A pharmaceutical composition comprising at least one compound as claimed in claim 1 and their pharmaceutically acceptable salts, in an amount which is anti-hypertensively effective or effective as a central nervous system depressant and at least one pharmaceutically acceptable diluent or carrier.

4,233,308

MICROBICIDAL COMPOSITIONS

Walter Kunz, Oberwil, Switzerland; Wolfgang Eckhardt, Lörrach, Fed. Rep. of Germany, and Adolf Hubele, Magden, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

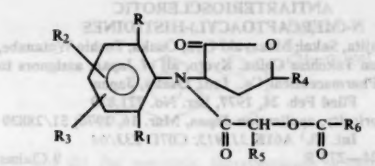
Filed Jan. 25, 1979, Ser. No. 6,398

Claims priority, application Switzerland, Jan. 28, 1978, 931/78

Int. Cl.³ C07D *307/32;* **A61K** *31/335*

U.S. Cl. 424—279 **9 Claims**

1. A compound of the formula I



(I)

in which

R is C_1–C_4-alkyl, C_1–C_4-alkoxy or halogen,

R_1 is hydrogen, C_1–C_3-alkyl, C_1–C_4-alkoxy or halogen,

R_2 is hydrogen, C_1–C_3-alkyl or halogen,

R_3 is hydrogen or methyl, with the total number of C atoms of the substituents R, R_1, R_2, and R_3 in the phenyl ring not exceeding 8,

R_4 and R_5 independently of one another are hydrogen or methyl, and

R_6 is a C_1–C_4-alkyl group unsubstituted or substituted by halogen, thiocyano, cyano, C_1–C_4-alkoxy or C_1–C_4-alkylthio, or R_6 is a C_2–C_5-alkenyl or C_3–C_7-cycloalkyl group each unsubstituted or mono- or polysubstituted by halogen, or R_6 is a phenyl or benzyl group each unsubstituted or substituted by halogen, nitro, C_1–C_4-alkyl or C_1–C_4-alkoxy, or R_6 is a furan, or tetrahydrofuran group unsubstituted or substituted by methyl.

5. A phytomicrobicidal composition which comprises as active ingredient an effective phytomicrobicidal amount of a compound of the formula I according to claim 1, together with a suitable carrier therefor.

9. A process for controlling phytopathogenic fungi, which process comprises application of a phytopathogenic fungicidally effective amount of a compound of the formula I of claim 1 to the plants or to a locus liable to be infected by such fungi.

4,233,309

NOVEL 1-SUBSTITUTED-3-ACYLPYRROLE DERIVATIVES, PLATELET AGGREGATION INHIBITORS CONTAINING THEM, AS ACTIVE INGREDIENTS, AND PROCESSES FOR PRODUCTION OF SAID DERIVATIVES

Toshio Tanaka; Akira Otsu; Seizi Kurozumi, all of Hino, and Toshio Wakabayashi, Tama, all of Japan, assignors to Teijin Limited, Osaka, Japan

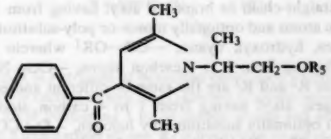
Filed Dec. 4, 1978, Ser. No. 966,050

Claims priority, application Japan, Dec. 6, 1977, 52-145702; Jan. 10, 1978, 53-801

Int. Cl.³ C07D *207/00;* **A61K** *31/40*

U.S. Cl. 424—270 **3 Claims**

1. 1-Substituted-3-benzoylpyrrole derivatives of the formula



(I)

wherein R_5 represents a hydrogen atom or a lower alkyl group with 1 to 4 carbon atoms.

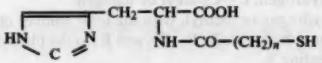
3. A platelet aggregation inhibiting agent comprising an effective amount of the 1-substituted-3-acylpyrrole derivative of claim 1 and a pharmaceutically acceptable carrier or diluent.

4,233,310
ANTIARTERIOSCLEROTIC N-(MERCAPTOACYL)-HISTIDINES

Tadashi Fujita, Sakai; Masayuki Oya, Osaka; Toshio Watanabe, Suita, and Takehisa Chiba, Kyoto, all of Japan, assignors to Santen Pharmaceutical Co., Ltd., Osaka, Japan

Filed Feb. 24, 1977, Ser. No. 771,839
Claims priority, application Japan, Mar. 16, 1976, 51/28839
Int. Cl.[3] A61K *31/415*; C07D *233/64*
U.S. Cl. 424—273 R **9 Claims**

7. An antiarteriosclerosis composition containing an effective amount of N-(mercaptoacyl)-histidine represented by formula (I) wherein n is 1 or 2



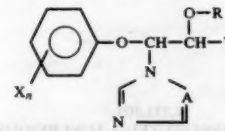
and a pharmacetical carrier.

4,233,311
ANTIMICROBIAL AGENTS AND THEIR USE

Wolfgang Kramer; Karl H. Büchel; Manfred Plempel, and Ingo Haller, all of Wuppertal, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 18, 1978, Ser. No. 897,900
Claims priority, application Fed. Rep. of Germany, May 10, 1977, 2720868
Int. Cl.[3] A61K *31/41, 31/415, 31/555*
U.S. Cl. 424—273 R **14 Claims**

1. A pharmaceutical composition containing as an active ingredient on antimycotically effective amount of a compound which is an azolyl ether of the following formula, or its salt or a metal complex thereof



(I)

in which

A is a CH group,

R is alkyl, alkenyl or alkinyl, each having up to 4 carbon atoms, phenyl or benzyl, each being optionally mono- or poly-substituted by halogen, cyano, nitro, alkyl having from 1 to 4 carbon atoms, alkoxy-carbonyl having from 1 to 4 carbon atoms in the alkyl moiety, and halogenoalkyl having up to 2 carbon atoms and up to 3 halogen atoms,

X is halogen, alkyl, alkoxy, alkylthio, alkylsulphonyl, halogenoalkyl or alkoxycarbonyl, each having up to 4 carbon atoms in the alkyl moiety, nitro, cyano, or phenyl, phenoxy or phenylthio, each optionally substituted by halogen, cyano, nitro or halogenoalkyl having up to 2 carbon atoms and up to 3 halogen atoms,

Y is a straight-chain or branched alkyl having from 1 to 9 carbon atoms and optionally mono- or poly-substituted by halogen, hydroxyl, cyano, —CO—OR^1 wherein R^1 is alkyl having from 1 to 4 carbon atoms, —CO—NR^2R^3 wherein R^2 and R^3 are the same or different and each is hydrogen, alkyl having from 1 to 4 carbon atoms, or phenyl optionally substituted by halogen, —O—CO—R^4 wherein R^4 is alkyl having from 1 to 18 carbon atoms, halogenoalkyl having from 1 to 4 carbon atoms and from 1 to 3 halogen atoms, phenyl or benzyl each optionally mono- or poly-substituted by halogen or cycloalkyl having 5 or 6 carbon atoms; or phenyl optionally mono- or poly-substituted by halogen, and

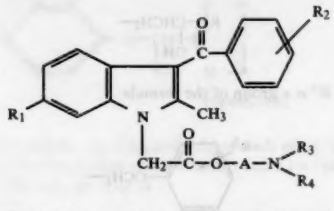
n represents an integer having a value of from 0 to 5, in admixture with a solid, liquid or liquefied gaseous diluent.

4,233,312
ESTERS OF INDOLE-1-ACETIC ACID AND ANALGESIC USE THEREOF

Andre Allais, Gagny; Jean Meier, La Varenne Saint-Hilaire, and Roger Deraedt, Pavillons-sous-Bois, all of France, assignors to Roussel Uclaf, Paris, France

Division of Ser. No. 758,633, Jan. 12, 1977, Pat. No. 4,105,777. This application May 9, 1978, Ser. No. 904,328
Int. Cl.[3] A61K *31/40*; C07D *209/20*
U.S. Cl. 424—274 **11 Claims**

1. A compound selected from the group consisting of indoles of the formula



wherein R_1 is selected from the group consisting of hydrogen halogen, —CF_3, alkyl of 1 to 8 carbon atoms and alkoxy of 1 to 8 carbon atoms, R_2 is in the 2, 3 or 4 position and is selected from the group consisting of halogen, —CF_3 and alkyl, alkoxy and alkylthio of 1 to 8 carbon atoms, A is selected from the group consisting of branched alkylene of 3 to 5 carbon atoms and —$(CH_2)_n$— and n is a number of 2 to 5 and R_3 and R_4 taken together with the nitrogen atom form a heterocyclic ring selected from the group consisting of piperidinyl, pyrrolidinyl, morpholinyl, piperazinyl and N-alkylpiperazinyl with 1 to 4 alkyl carbon atoms and their non-toxic, pharmaceutically acceptable acid addition salts.

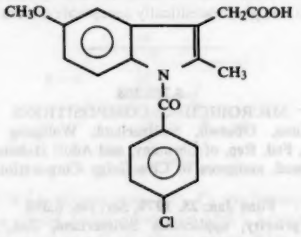
4,233,313
ANALGESIC POTENTIATION

Joseph F. Gardocki, Doylestown, Pa., assignor to McNeilab, Inc., Fort Washington, Pa.

Filed Dec. 18, 1978, Ser. No. 970,509
Int. Cl.[2] A61K *31/40, 31/165*
U.S. Cl. 424—274 **2 Claims**

1. A method for producing analgesia which comprises orally administering to a subject suffering from pain

(1) from about 0.13 to 0.27 mg/kg of body weight of a 1-(p-chlorobenzoyl)-5-methoxy-2-methylindole-3-acetic acid compound, said compound being selected from 1-(p-chlorobenzoyl-5-methoxy-2-methylindole-3-acetic acid having the formula



and (b) and therapeutically acceptable salts thereof, and

(2) from about 3.8 to 7.5 mg/kg of body weight of acetaminophen.

4,233,314

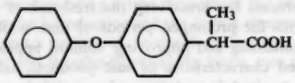
ANALGESIC POTENTIATION

Joseph F. Gardocki, Doylestown, Pa., assignor to McNeilab, Inc., Fort Washington, Pa.

Filed Dec. 18, 1978, Ser. No. 970,510
Int. Cl.[2] A61K *31/19, 31/165*
U.S. Cl. 424—317 **7 Claims**

1. A method for producing analgesia which comprises orally administering to a subject suffering from pain

(1) as primary active agent from about 1.4 to 2.5 mg/kg of body weight of an α-methyl-3-phenoxy-benzeneacetic acid compound, said compound being selected from (a) α-methyl-3-phenoxybenzeneacetic acid represented by the formula



and (b) non-toxic therapeutically acceptable salts thereof, and

(2) as potentiating agent, from 3.8 to 7.5 mg/kg of body weight of acetaminophen.

4,233,315

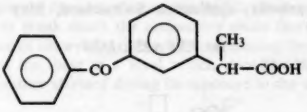
ANALGESIC POTENTIATION

Joseph F. Gardocki, Doylestown, Pa., assignor to McNeilab, Inc., Fort Washington, Pa.

Filed Dec. 18, 1978, Ser. No. 970,512
Int. Cl.[2] A61K *31/19, 31/165*
U.S. Cl. 424—317 **8 Claims**

5. A method for producing analgesia which comprises orally administering to a subject suffering from pain

(1) as primary active agent from about 0.2 to 0.83 mg/kg of body weight of a m-benzoylhydratropic acid compound selected from the group consisting of (a) m-benzoylhydratropic acid having the formula



and (b) the non-toxic therapeutically acceptable salts thereof, and

(2) as potentiating agent from about 2.8 to 7.5 mg/kg body weight of acetaminophen.

4,233,316

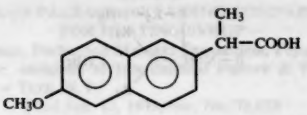
ANALGESIC POTENTIATION

Joseph F. Gardocki, Doylestown, Pa., assignor to McNeilab, Inc., Fort Washington, Pa.

Filed Dec. 18, 1978, Ser. No. 970,519
Int. Cl.[2] A61K *31/19*
U.S. Cl. 424—317 **7 Claims**

1. A method for producing analgesia which comprises orally administering to a subject suffering from pain

(1) as primary antinociceptive agent from about 1.4 to 2.1 mg/kg of body weight of a 6-methoxy-α-methyl-2-naphthaleneacetic acid compound, said compound selected from (a) 6-methoxy-α-methyl-2-naphthaleneacetic acid having the formula



and (b) the non-toxic therapeutically acceptable salts thereof, and

(2) as potentiating agent from about 2.8 to 7.5 mg/kg body weight of acetaminophen.

4,233,317

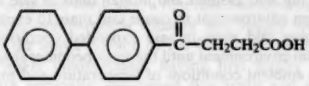
ANALGESIC POTENTIATION

Joseph F. Gardocki, Doylestown, Pa., assignor to McNeilab, Inc., Fort Washington, Pa.

Filed Dec. 18, 1978, Ser. No. 970,520
Int. Cl.[2] A61U *31/19, 31/165*
U.S. Cl. 424—317 **8 Claims**

1. A method for producing analgesia which comprises orally administering to a subject suffering from pain

(1) as primary antinociceptive agent from about 2.2 to 7.2 mg/kg of body weight of a 3-(4-biphenylylcarbonyl) propionic acid compond, said compound selected from (a) 3-(4-biphenylylcarbonyl) propionic acid represented by the formula



and (b) the non-toxic therapeutically acceptable salts thereof, and

(2) as potentiating agent from about 1.9 to 7.5 mg/kg of body weight of acetaminophen.

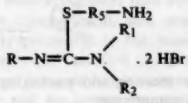
4,233,318

BIOCIDAL ISOTHIOUREA COMPOUNDS

Llewellyn W. Fancher, and Don R. Baker, both of Orinda, Calif., assignors to Stauffer Chemical Company, Westport, Conn.

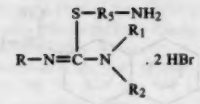
Continuation of Ser. No. 815,975, Jul. 15, 1977, abandoned. This application Mar. 22, 1979, Ser. No. 22,755
Int. Cl.[3] C07C *123/00;* **C07D** *213/74;* **A01N** *43/40, 47/42*
U.S. Cl. 424—326 **60 Claims**

1. A compound having the general structural formula



wherein R is a straight or branched chain alkyl radical containing 5 to 20 carbon atoms; R_1 is selected from the group consisting of alkyl containing 1 to 20 carbon atoms and alkenyl containing 2 to 6 carbon atoms; R_2 is hydrogen or alkyl containing 1 to 10 carbon atoms; and R_5 is divalent alkylene containing 2 to 6 carbon atoms.

30. A method of controlling a microorganism selected from bacteria and fungi which comprises applying to the locus where such control is desired an effective amount of a compound having the general structural formula



wherein R is a straight or branched chain alkyl radical containing 5 to 20 carbon atoms; R_1 is selected from the group consisting of alkyl containing 1 to 20 carbon atoms and alkenyl containing 2 to 6 carbon atoms; R_2 is hydrogen or alkyl containing 1 to 10 carbon atoms; and R_5 is divalent alkylene containing 2 to 6 carbon atoms.

4,233,319

LOW DENSITY CHEWING GUM PRODUCT AND METHOD OF MAKING THE SAME

Douglas P. Fritz, and Ronald J. Elias, both of Mountaintop, Pa., assignors to Topps Chewing Gum, Incorporated, Brooklyn, N.Y.

Filed Apr. 9, 1979, Ser. No. 28,335
Int. Cl.³ A23G *3/30*
U.S. Cl. 426—5 **21 Claims**

1. The method of manufacturing a low density chewing gum product which comprises the steps of:

heating a chewing gum composition to cause the same to liquefy;

gasifying said molten gum mass to homogeneously introduce thereinto a gaseous component and reduce the density of said mass;

introducing said gasified mass into a mold;

introducing said gasified and molten mass in said mold to a vacuum environment to cause said mass to expand; and

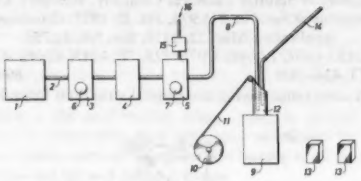
maintaining said mass in said expanded condition in said vacuum environment until the same becomes shape-retaining at ambient conditions of temperature and pressure.

4,233,320

METHOD FOR STERILIZING, HOMOGENIZING AND PACKAGING PROTEIN CONTAINING FOOD

Jose R. Monaco, Santiago, Chile, and Hans A. Rausing, Lund, Sweden, assignors to Tetra Pak Developpement SA, Pully-Lausanne, Switzerland

Filed Jan. 23, 1979, Ser. No. 5,909
Claims priority, application Sweden, Jan. 23, 1978, 7800776
Int. Cl.³ A23B *4/00*; A22C *25/20*
U.S. Cl. 426—7 **12 Claims**



1. A method for treating and packaging a food product containing proteins comprising:

(a) providing a raw product containing proteins;

(b) reducing the raw product to a plurality of particles having a size smaller than 5 mm. to change the raw product to a homogenous fluid or semifluid form;

(c) sterilizing the raw product thereby at least partly causing the proteins to coagulate;

(d) cooling the at least partly coagulated sterilized raw product to below the coagulating temperature;

(e) homogenizing the cooled product to fluid or semifluid form; and

(f) packing the sterilized, homogenized product under aseptic conditions into bacteriaproof packages and allowing the packed product to thicken to solid or semisolid form.

4,233,321

WHITE PAN BREAD AND ROLL PROCESS AND PRODUCT

Sylvester F. Zenner, Memphis, Tenn., and Daniel C. Stanberry, Mission Viejo, Calif., assignors to Patent Technology, Inc., San Francisco, Calif.

Continuation-in-part of Ser. No. 834,808, Sep. 19, 1977, abandoned, which is a continuation of Ser. No. 722,218, Sep. 10, 1976, abandoned. This application Oct. 25, 1978, Ser. No. 954,644
Int. Cl.³ A21D *13/00, 15/00*
U.S. Cl. 426—19 **5 Claims**

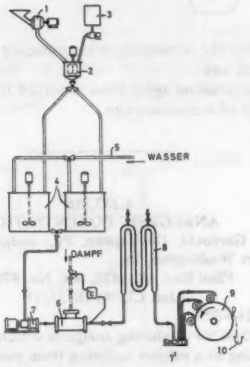
1. In a process for preserving the freshness of white pan bread or rolls for prolonged periods of time while simultaneously maintaining and improving volume, appearance and other desired characteristics of said products, said process employing standard formulations of essential dough ingredients including flour, water, leavening, 6 to 13% sugar and 2.5 to 8% shortening on the weight of the flour, the improvement comprising the steps of employing lactose as a replacement for 10 to 50% by weight of the sugar content and 10 to 50% by weight of the shortening content in such a standard formulation, thereafter mixing the formula ingredients including said replacement lactose to form a dough, dividing the dough into units for baking, and baking said units to provide white pan bread and rolls which exhibit desired characteristics of "freshness" for periods of time at least 50 to 100% longer than white pan bread and rolls prepared with said standard formulation without said replacement lactose, and which also exhibit substantially increased volumes and improved external appearance scores as compared to said standard formulation bread and rolls.

4,233,322

MANUFACTURING OF INSTANT PRODUCTS FROM LEGUMES

Hartwig Fritze, Weingarten, Fed. Rep. of Germany, assignor to Escher Wyss Limited, Zurich, Switzerland

Filed May 16, 1978, Ser. No. 906,610
Claims priority, application Switzerland, May 25, 1977, 006433/77
Int. Cl.³ A23L *1/20*
U.S. Cl. 426—46 **9 Claims**



1. A process for manufacturing a powdered, instant soup or puree product for human consumption from pulse vegetables comprising the steps of

a. finely milling whole pulse seeds under dry conditions to

such extent that the exosperm parts are disintegrated and are indiscernible and inseparable from the flour parts;

b. mixing said finely milled pulse material with water and α-amylase to form a suspension; and

c. continuously conveying said suspension successively through a short, intensive heating phase wherein boiling of the suspension is effected in a time period on the order of seconds so as to effect rapid hydrolysis without destroying the natural taste of the pulse material and without deactivating the α-amylase, a longer reaction phase having a duration on the order of minutes wherein decomposition of starch in the pulse material by the α-amylase continues without further heating, and a drying phase wherein the suspension is dried and the α-amylase is deactivated,

d. the α-amylase being active throughout the entire period between its introduction and the drying phase and serving to convert a portion of the starch in the pulse material to maltose and thereby eliminate the bitter, raw taste of the pulse.

4,233,323
METHOD FOR TENDERIZING AND/OR PASTEURIZING MEAT

Boris Sway, 7201 W. Aracoma Dr., Cincinnati, Ohio 45237, and Walter C. Reiman, 175 Tamworth Rd., Troy, Ohio 45373

Continuation-in-part of Ser. No. 761,482, Jan. 24, 1977, abandoned. This application Nov. 8, 1978, Ser. No. 958,823

Int. Cl.[2] A23L *3/28*

U.S. Cl. 426—55 **11 Claims**

8. A method of tenderizing retail cuts of fresh, wrapped meat, which comprises the steps of:

(a) wrapping the meat in a moisture-impervious film which is substantially pervious to ultraviolet rays in the 2600 to 3000 A° range;

(b) placing the wrapped meat within a closed chamber;

(c) subjecting the outer surfaces of said meat to ultraviolet rays until from 55% to 95% of the aerobic and anaerobic bacteria of the surface of the meat adjacent the film have been killed;

(d) terminating exposure of the wrapped meat to said ultraviolet rays before a color change occurs in the outer surfaces of the meat;

(e) permitting the natural enzymes within the meat to continue to break down the connective tissue thereof in the absence of ultraviolet rays while maintaining the temperature of the meat at a level which does not exceed the temperature attained during its exposure to the ultraviolet rays;

resubjecting the outer surfaces of the meat to ultraviolet rays while the meat is at a temperature naturally obtained from step (e) to kill most of the surface bacteria that are reproduced thereon during step (e) from surface bacteria remaining after step (c), without lowering the temperature of the meat; and

(g) repeating steps (c), (d), (e) and (f) until the wrapped meat has attained the desired degree of tenderization.

4,233,324
ISOLATED SOY PROTEIN COMPOSITION

Felix A. Jehle, Brooklyn, N.Y., and Fawzy Ali, Roselli Park, N.J., assignors to International Vitamin Corp., Union, N.J.

Filed May 30, 1978, Ser. No. 910,308

Int. Cl.[3] A23J *3/00*

U.S. Cl. 426—96 **2 Claims**

1. A composition consisting essentially of isolated soy protein particles and a coating thereon of from 0.5 to 3.0 percent by weight of silicon dioxide, and from 0.1 to 3.0 percent by weight of ammoniated glycyrrhiza, said ammoniated glycyrrihiza being effective to conceal the taste of said soy protein particles but being present in insufficient amount to cause a licorice taste.

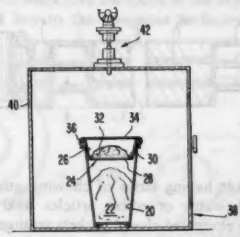
4,233,325
ICE CREAM PACKAGE INCLUDING COMPARTMENT FOR HEATING SYRUP

Gary Slangan, Fuchu, and Masaaki Tsunashima, Fujisawa, both of Japan, assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Sep. 13, 1979, Ser. No. 75,028

Int. Cl.[3] B65D *85/78, 25/08;* B65B *29/08, 25/22*

U.S. Cl. 426—107 **9 Claims**



1. A food package comprising a container having two compartments arranged vertically, a first lower compartment and a second upper compartment slidably and snugly and fixedly fitting into the upper portion of the first lower compartment, said first lower compartment having first totally enclosing substantially vertically juxtaposed side walls and a substantially flat bottom portion around the outer edge of which said side walls are connected, and frozen ice cream resting on said bottom portion, said first side walls having an upper edge, and resting firmly on said upper edge and snugly and fixedly fitting against the inner portion of said side walls, said second upper compartment comprising second side walls and a substantially flat bottom being in a plane substantially parallel to the bottom portion of said first lower compartment and spaced from the ice cream therebelow, said second side walls being of such dimensions as to fit snugly and fixedly against the inner portion of said first side walls of said first compartment, said bottom of said second upper compartment being constructed of a microwave-resistant metal foil material and located on the upper surface of said bottom of said second upper compartment, a frozen syrup composition, said bottom of said second upper compartment being manually puncturable; and covering said second compartment, and supported on the upper edge of said second side walls, a microwave-permeable transparent lid having a diameter minutely greater than the outer diameter of said second upper compartment, said transparent lid being substantially totally permeable to the passage of microwave energy, the dimensions of said first compartment and of said second compartment being such that conveniently consumable portions of syrup and ice cream are contained within said compartments, the volume of said ice cream being less than the internal volume of said first compartment, so that when microwave energy is generated from a location directly above said food package and in a direction substantially perpendicular to the metal foil microwave-resistant bottom of said second upper compartment, said frozen syrup melts and becomes fluid, and of such a low viscosity that it will flow as a result of the force of gravity either: (i) through a manually created orifice in said metal foil microwave-resistant bottom or (ii) by means of manually pouring the syrup from said second upper compartment into said first lower compartment.

4,233,326
PACKAGE FOR INDIVIDUALLY WRAPPED STRIP-SHAPED PIECES OF CHEWABLE AND EDIBLE ARTICLES

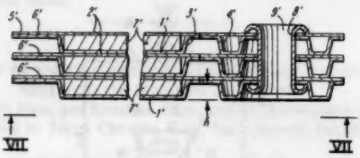
Klaus A. Sontag, Überseering 25, 2000 Hamburg 60, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 855,930, Nov. 29, 1977, abandoned. This application Jan. 18, 1979, Ser. No. 4,584

Claims priority, application Fed. Rep. of Germany, Nov. 30, 1976, 2654179; May 26, 1978, 7815738[U]

Int. Cl.[2] B65D *85/62, 83/08, 75/32*

U.S. Cl. 426—115 **3 Claims**



1. A package having strips of chewing gum, sweets, food, and other chewable or edible articles held individually in relatively flat elongated closed packets arranged one above the other; each of said packets comprising a lower foil portion and a thinner upper foil portion substantially covering said lower foil portion; said lower foil portion having a pan shaped depression located at one end of the packet and a continuous closed depression enclosing an undepressed portion of said lower foil portion and located at the other end of said packet and connected to said pan shaped depression by another undepressed portion of the lower foil portion; said upper foil portion being sealed to the lower foil portion at the undepressed portions of the lower portion; the upper foil portions of each packet sealed over the pan shaped depression forming sealed chambers with said articles contained therein; the upper foil portion and the lower foil portion being unsealed at the edge of the packet adjacent the pan shaped depression thus forming a flap for tearing open the sealed chambers; said continuous depression surrounding a hole in the undepressed portion of said lower portion having a rivet or pin forming an axis passing therethrough with said rivet or pin including means so that all the packets are held together one above the other yet are capable of being pivoted selectively in a fan-like manner; said undepressed portion connecting the pan shaped depression and said continuous depression and the upper foil portion which overlies it being perforated for removal of the pan shaped depression from said continuous depression and said rivet or pin; the pan shaped depression and the continuous depression being of equal depth so that the continuous depressions act as spacer bodies along said rivet or pin so that satisfactory pivoting of the packets are possible even when a portion of the packet formed by the pan shaped depression and its overlying upper foil portion is removed.

4,233,327
PROCESS FOR PRODUCING INSTANT-COOKING RICE

Momofuku Ando, Osaka; Junichi Minami, Tondabayashi; Mitsumune Takata, Kusatsushi; Fumio Ohnishi, Osaka, and Shunichi Kawamoto, Kusatsushi, all of Japan, assignors to Momofuku Ando, Osaka, Japan

Continuation of Ser. No. 765,000, Feb. 2, 1977, abandoned, which is a continuation-in-part of Ser. No. 609,728, Sep. 2, 1975, abandoned. This application Jun. 26, 1978, Ser. No. 918,920

Claims priority, application Japan, Sep. 5, 1974, 49/102637; Sep. 30, 1974, 49/112989

Int. Cl.[2] A23L *1/18*

U.S. Cl. 426—242 **5 Claims**

1. A process for preparing instant-cooking rice consisting essentially of the steps of:

(a) soaking rice in water or seasoning liquid so that its water content is 20–35% by weight;

(b) mixing the soaked rice with 0.1–1.0% by weight of a surfactant, edible oil or talc;

(c) completely gelatinizing the soaked rice with steam at a temperature of 100°–140° C.;

(d) reducing the moisture content of the gelatinized rice to 25–35% by weight by exposing it to air at a temperature of 40°–120° C.;

(e) pressing the reduced-moisture containing gelatinized rice between rolls spaced from 0.1–1.0 mm apart without producing cracks and fissures therein;

(f) drying the pressed rice to 8–25% by weight be exposing it to air at a temperature of 20°–100° C.;

(g) aging the dried rice in a closed chamber at a temperature of 15°–35° C. for at least 30 minutes to equalize the moisture distribution within the grains; and

(h) puffing the aged rice with hot air at a temperature of 160°–450° C.

4,233,328
EDIBLE MATERIALS COLORED WITH POLYMERIC YELLOW COLORANT

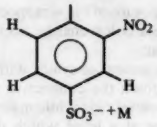
Daniel J. Dawson, Los Altos; Kenneth M. Otteson, San Bruno, and Roman Davis, Palo Alto, all of Calif., assignors to Dynapol, Palo Alto, Calif.

Division of Ser. No. 786,310, Apr. 11, 1977, abandoned, which is a continuation-in-part of Ser. No. 748,575, Dec. 8, 1976, abandoned. This application Oct. 4, 1978, Ser. No. 948,465

Int. Cl.[2] A23L *1/275*

U.S. Cl. 426—250 **19 Claims**

1. A colored edible material comprising an edible material in intimate admixture with a color-imparting concentration of a water-soluble polymeric yellow colorant comprising a non-chromophoric organic backbone of molecular weight of from 1000 to 200,000 having covalently attached thereto through amine groups a plurality (n) in the range of from 10 to 2000, of chromophore units of the structure



wherein M^+ is a pharmacologically acceptable cation.

4,233,329
CONCENTRATED ACID SWELLING OF COLLAGEN IN PREPARATION OF EDIBLE COLLAGEN CASING

Noel I. Burke, Danville, Ill., assignor to Tee-Pak, Inc., Chicago, Ill.

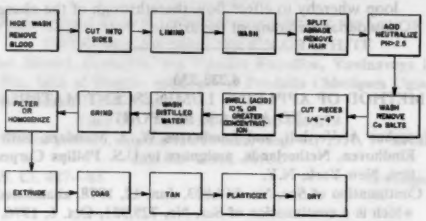
Continuation of Ser. No. 561,117, Mar. 25, 1975, abandoned, which is a continuation of Ser. No. 347,293, Apr. 2, 1973, abandoned. This application Oct. 18, 1976, Ser. No. 733,559

Int. Cl.[3] A22C *13/00*

U.S. Cl. 426—277 **8 Claims**

1. A process of producing an edible tubular collagen casing from animal hide collagen which comprises the steps, in sequence, of cutting collagen splits which have been derived from limed hides exposed to substantial liming into small pieces, contacting the collagen pieces with an aqueous solution of a non-toxic acid having a concentration of 10–45% by weight and a dissociation constant in water of about 1×10^{-6} to 1×10^{-3}, at a pH of 1.5–3.5 for a time sufficient to effect substantially complete swelling of the collagen, grinding the collagen pieces into successively smaller particles until a pulp

of swollen collagen is formed, forming a slurry containing about 2–8% by weight collagen pulp, extruding the slurry in



tubular form, coagulating, tanning and drying the casing thus formed to obtain the tubular casing.

4,233,330

CAKE PROCESS AND PRODUCT

Sylvester F. Zenner, Memphis, Tenn., and Daniel C. Stanberry, Mission Viejo, Calif., assignors to Patent Technology, Inc., San Francisco, Calif.

Continuation-in-part of Ser. No. 834,808, Sep. 19, 1977, abandoned, which is a continuation of Ser. No. 722,218, Sep. 10, 1976, abandoned. This application Oct. 25, 1978, Ser. No. 954,646

Int. Cl.³ A21D *13/08, 15/00*

U.S. Cl. 426—321 **6 Claims**

1. In a process for preserving the freshness of standard yellow, white or devil's food cakes for prolonged periods of time while simultaneously maintaining and improving volume, appearance and other desired characteristics of said cake products, said process employing standard formulations of essential cake mix ingredients including flour, water, leavening, and 24 to 32% sugar and 8 to 13% shortening on the weight of the flour, the improvement comprising the steps of employing lactose as a replacement for10 to 35% by weight of the sugar content and 10 to 35% by weight of the shortening content in said standard cake mix formulations, thereafter mixing the formula ingredients including said replacement lactose to form a batter, forming the batter into at least one unit for baking, and baking said unit to provide a cake product which exhibits desired characteristics of "freshness" for periods of time at least 100% and ranging up to 400% longer than yellow, white and devil's food cakes prepared with said standard formulation mixes without said replacement lactose, and which also exhibit substantially increased volumes and improved external appearance scores as compared to said standard formulation cakes.

4,233,331

METHOD OF SECURING OPENER KEY TO A CONTAINER USING ORIENTED POLYPROPYLENE FILM WITH SOLVENTLESS ACRYLIC ADHESIVE

Harold C. Lemke, Grayslake, and Stanley E. Rohowetz, Barrington, both of Ill., assignors to American Can Company, Greenwich, Conn.

Filed Jul. 31, 1978, Ser. No. 929,489

Int. Cl.³ B65B *55/02, 61/18;* B32B *31/00;* B29C *27/20*

U.S. Cl. 426—407 **5 Claims**

1. A method of securing a key for opening a sealed container to a portion of the container at high speed wherein the key includes a working end and an operating end with a middle portion therebetween said method being continuous and comprising:

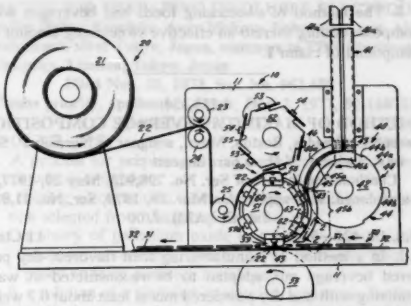
(a) providing a container end for hermetically closing a container for carrying food stuff to the exclusion of environs which would taint and spoil the food stuff, said container end having a surface adequate for supporting the key, and said container including a portion which is key openable for removal of the food stuff;

(b) dispensing a strip of flexible polymeric oriented polypropylene film which carries a solventless acrylic adhesive layer which when heated becomes stickier on one surface thereof;

(c) placing a key across said adhesive layer for carrying same in the plane of the adhesive to form an assembly thereof;

(d) orienting a surface of the key adequate for supporting the key adjacent to and parallel with the support surface of the container;

(e) applying the tape and key assembly, at over 100 per minute, with the solventless acrylic adhesive surface of the polypropylene strip across the end surface of the container over and above the shank of the key for securing the oriented key to the container surface in a manner



which permits removal of the key by subjection of the interface between the key and the container to tensile and bending loadings but which resists disorientation of the key responsive to shear loads between the key and the surface;

(f) filling the container with the food stuff and hermetically sealing it; and

(g) autoclaving at a sterilizing temperature the sealed container and key combination in order to sterilize the food stuff without degradation to the surface of the strip or the interface but with selected shrinkage to draw the key and end into more intimate engagement and increasing the stickiness of the adhesive layer.

4,233,332

USE OF BICYCLIC NITROGEN-CONTAINING DERIVATIVES AS FLAVORING INGREDIENTS

Ivon Flament, Geneva, Switzerland, assignor to Firmenich SA, Geneva, Switzerland

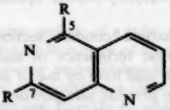
Filed Mar. 1, 1979, Ser. No. 16,405

Claims priority, application Switzerland, Mar. 16, 1978, 2863/78

Int. Cl.³ A23L *1/231*

U.S. Cl. 426—537 **3 Claims**

1. A process for enhancing, improving or modifying the organoleptic properties of materials selected from foodstuffs and beverages, which process comprises the step of adding thereto a small but flavouring effective amount of a compound of formula



[(I)]

wherein each of symbols R represents a lower alkyl radical or a hydrogen atom or one of them a lower alkyl radical and the other a hydrogen atom, to impart a gustative note of animal or burnt character to said foodstuff or beverage.

4,233,333

4,5-DIMETHYL-THIENO[3,2-d]ISOTHIAZOLO-3(2H)-ONE-1,1-DIOXIDES, COMPOSITIONS, AND METHODS OF USE AS A SWEETENER

Günter Trummlitz; Ernst Seeger, and Wolfhard Engel, all of Biberach, Fed. Rep. of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Fed. Rep. of Germany

Filed Oct. 20, 1978, Ser. No. 952,958

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1977, 2749640; Sep. 9, 1978, 2839266

Int. Cl.[3] A23G *1/236;* C07D *275/00*

U.S. Cl. 426—548 3 Claims

1. 4,5-Dimethyl-thieno[3,2-d]isothazole-3(2H)-one-1,1-dioxide or a non-toxic salt thereof formed with an inorganic or organic base.

3. The method of sweetening foods and beverages which composes adding thereto an effective sweetening amount of a compound of claim 1.

4,233,334

METHOD OF MAKING A BEVERAGE COMPOSITION

Joseph L. Owades, Boston, Mass., assignor to Norman P. Soloway, Amherst, N.H., a part interest

Continuation-in-part of Ser. No. 798,923, May 20, 1977, abandoned. This application Mar. 19, 1979, Ser. No. 21,812

Int. Cl.[2] A23L *2/00*

U.S. Cl. 426—590 11 Claims

1. In a method of manufacturing fruit flavored, dry powdered beverage mix adapted to be reconstituted in water, admixing with said dry powdered mix at least about 0.7 weight percent of dry beaten cellulose pulp of Canadian Standard freeness of less than about 500, said dry cellulose pulp being derived by beating cellulose in water to said degree of freeness, removing excess water, and drying the resulting beaten pulp in contact with a particulate edible solid.

4,233,335

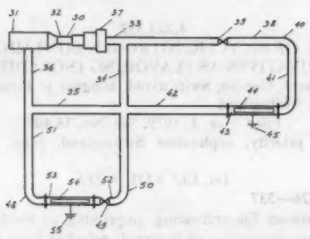
ELECTROSTATIC COATING METHOD

Vladimir N. Etlin, 7403 Lisle Ave., Falls Church, Va. 22043

Division of Ser. No. 741,893, Nov. 15, 1976, Pat. No. 4,170,194. This application Mar. 6, 1979, Ser. No. 17,838

Int. Cl.[3] B05D *1/04*

U.S. Cl. 427—27 2 Claims



1. The method of coating an object with electrostatically charged powder comprising the steps of:

providing a continuously open closed circuit conduit loop including a high velocity blower operatively associated therewith;

establishing an enlarged conduit section in said loop whereby to increase turbulence of said powder to be circulated through said loop by use of said high velocity blower to thereby provide said powder with an electrostatic charge;

providing at least one branch conduit to establish a second loop selectively communicated with the first recited loop;

positioning said object in said branch conduit;

establishing said powder circulation until the powder acquires a substantial electrostatic charge;

communicating said branch conduit with the first recited loop whereby to effect flow therethrough of the charged powder and coating of the article.

4,233,336

METHOD OF APPLYING LUMINESCENT MATERIAL TO A GLASS SUPPORT

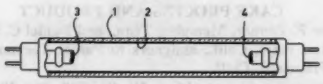
Josephus A. Verdult, and Lambertus W. J. Manders, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 868,803, Jan. 12, 1978, abandoned, which is a continuation of Ser. No. 729,951, Oct. 6, 1976, abandoned. This application Jun. 25, 1979, Ser. No. 51,490

Claims priority, application Netherlands, Oct. 17, 1975, 7512188

Int. Cl.[3] B05D *3/02;* C09K *11/465;* H01J *61/44;* B05D *7/22*

U.S. Cl. 427—67 4 Claims



1. A method for applying a coating of luminescent material to a glass surface which comprises the steps of: providing a luminescent material which consists of granular particles, each individual particle being homogeneous throughout the extent thereof, some of said granular particles being yttrium oxide activated by trivalent europium; providing a solution which consists of water and an alginate and which contains at least 0.5% of alginate relative to the weight of said luminescent material; mixing said solution and said luminescent material to obtain a stable suspension, coating the glass surface with said suspension and then heating said suspension sufficiently to burn off said alginate.

4,233,337

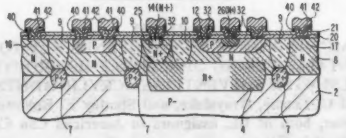
METHOD FOR FORMING SEMICONDUCTOR CONTACTS

Jules D. Friedman, Mahopac, and Lumdas H. Saraf, Fishkill, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 1, 1978, Ser. No. 901,902

Int. Cl.[2] H01L *29/48, 21/441*

U.S. Cl. 427—84 10 Claims



1. A method for selectively forming conductive contacts to impurity regions of a semiconductor substrate through a set of openings in a mask disposed atop said substrate comprising:

forming a protective layer of silicon dioxide within said set of openings;

removing said protective layer from a first subset of said openings while protecting a second subset of said openings, so as to expose a first subset of impurity regions;

depositing a first metallic silicide conductive contact material in said first subset of exposed impurity regions;

removing said protective layer by dip etching from said second subset of openings so as to expose a second subset of impurity regions without applying a resist layer atop said first contact material; and

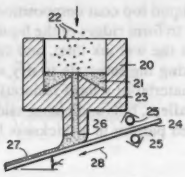
depositing a second conductive contact material in said first and second subsets of impurity regions.

4,233,338

PROCESSES FOR DEPOSITION OF THIN FILMS OF CRYSTALLINE SILICON ON GRAPHITE

Jean Ricard, Grenoble, and Charles Excoffon, Vaulnaveys le Bas, both of France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

Filed Jul. 24, 1978, Ser. No. 926,879
Claims priority, application France, Aug. 31, 1977, 77 26402
Int. Cl.[2] H01L *21/36*
U.S. Cl. 427—85 **10 Claims**



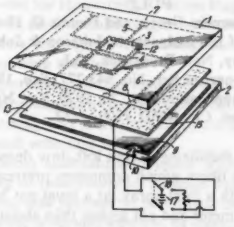
1. A process for providing crystalline silicon coatings on graphite substrates, which process comprises maintaining molten silicon material in a crucible having in its lower region a capillary conduit with a substantially vertical axis, the length of the capillary being at least equal to the retention height of the molten silicon material in the capillary to form a pendant drop at the bottom of the capillary; bringing a graphite substrate into contact with the drop of molten silicon material formed at the bottom of the capillary; moving the substrate at a selected speed in a direction which is at an angle of from 0° to about 60° with the horizontal, whereby molten silicon material flows downwardly through the capillary onto the substrate to form a thin film thereon; and periodically removing the crystalline silicon-coated substrate so formed.

4,233,339

METHOD FOR MAKING ELECTROCHROMIC FILMS HAVING IMPROVED ETCH RESISTANCE

Marshall Leibowitz, Ridgefield, Conn.; Richard Crandall, and Brian Faughnan, both of Princeton, N.J., assignors to Timex Corporation, Waterbury, Conn.

Filed Oct. 23, 1978, Ser. No. 953,716
Int. Cl.[3] G02F *1/01*
U.S. Cl. 427—108 **9 Claims**



1. A method for improving the resistance of electrochromic material to the degrading effects, such as etching, resulting from contact with electrolyte means associated with electrochromic displays, comprising the steps of:

(a) forming an amorphous, water-bearing film of electrochromic material of selected thickness, said film having electrochromic properties suitable for display purposes but having a free surface susceptible to etching by said electrolyte means;

(b) subjecting the film to a heat treatment at a selected high temperature at least equivalent to the crystallization temperature of said electrochromic material for a selected short time of sufficient duration so as to cause crystallization through at least the free surface portion of the film thickness but of insufficient duration to cause substantial loss of water from said film,

whereby crystallization of at least said free surface portion substantially increases resistance of the film to etching while retention of water in the film preserves the electrochromic properties for display purposes.

4,233,340

PROCESS FOR PREPARING INSOLUBLE ELECTRODE

Shunjiro Saito; Kazuhide Aue; Makoto Kobayashi, and Akio Nakamura, all of Tokyo, Japan, assignors to TDK Electronics Company, Limited, Tokyo, Japan

Filed Nov. 21, 1978, Ser. No. 962,659
Claims priority, application Japan, Dec. 2, 1977, 52-144751
Int. Cl.[3] B05D *5/12*
U.S. Cl. 427—125 **8 Claims**

1. A process for preparing an insoluble electrode for electrolysis which comprises:

(a) coating a conductive substrate with a coating composition selected from the group consisting of:

i. a slurry of palladium oxide in a solvent containing a platinum compound, which can be thermally decomposed to form platinum metal, and

ii. a solution of a platinum compound, which can be thermally decomposed to form platinum metal, in a solvent;

(b) baking the substrate treated by step (a);

(c) coating the substrate treated by step (b) with a coating composition selected from the group consisting of said coating composition (a)(i) and said coating composition (a)(ii); wherein the coating composition used in step (c) is different from that used in step (a);

(d) baking the substrate treated by step (c); and

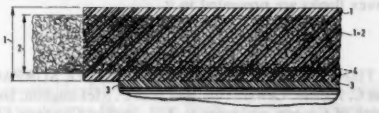
(e) repeating steps (a) to (d) two or more times.

4,233,341

PROCESS FOR PREPARING PACKAGING MATERIAL SUITABLE FOR SAUSAGE CASINGS AND ARTICLES MANUFACTURED THEREFROM

Klaus-Dieter Hammer, Mainz; Günter Gerigk, Oberursel, and Wolfgang Klendauer, Wiesbaden, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 22, 1976, Ser. No. 668,973
Claims priority, application Fed. Rep. of Germany, Mar. 24, 1975, 2512994
Int. Cl.[2] B29D *9/08*; A22C *13/02*
U.S. Cl. 427—230 **24 Claims**



8. Process for the preparation of a sausage casing, comprising the steps of:

coating the inside surface of a tube comprised of cellulose hydrate with a surface layer of a vinylidene chloride-containing copolymer, said cellulose hydrate being in a gelled condition and said vinylidene chloride-containing copolymer being applied directly to said inside surface in the form of an aqueous dispersion, said copolymer comprising from about 84 to 92% by weight of vinylidene chloride and from about 8 to 15% by weight of a mixture of co-

polymerizable monomers comprised of an α,β-unsaturated carboxylic acid selected from the group consisting of acrylic acid, methacrylic acid and mixtures thereof, and an ester of said carboxylic acid selected from the group consisting of acrylic acid esters, methacrylic acid esters and mixtures thereof, a major portion of said monomer mixture being comprised of said ester, said copolymer having been produced by copolymerization of a mixture of said vinylidene chloride and said copolymerizable monomers, the refractive index of said copolymer being substantially independent of temperature between about 40° C. and 80° C.;

a 1% by weight solution of said copolymer in tetrahydrofuran having a specific viscosity of at least about 1.8 and a 2% by weight solution of said copolymer in tetrahydrofuran having a specific viscosity of at least about 3; adjusting the water content of the coated tube to a predetermined value; aging the coated tube; and gathering the aged tube to form a shirred tube.

4,233,342

METHOD FOR VAPOR-COATING TURBINE BUCKETS

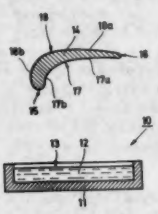
Hans Aichert; Walter Dietrich, both of Hanau am Main; Otto-Horst Hoffmann, Rodenbach; Friedrich Stark, Langenselbold, and Herbert Stephan, Bruchköbel, all of Fed. Rep. of Germany, assignors to Leybold-Heraeus GmbH, Cologne, Fed. Rep. of Germany

Filed Nov. 21, 1978, Ser. No. 962,836

Claims priority, application Fed. Rep. of Germany, May 13, 1978, 2821118

Int. Cl.[2] B23K *35/12*

U.S. Cl. 427—251 **5 Claims**



1. Method for vacuum depositing corrosion-and oxidation-resistant alloy coatings on all sides of curved turbine buckets having leading edges and trailing edges, with simultaneous rotation of the turbine buckets about their longitudinal axes in the vapor stream above a vapor source which comprises non-uniformly rotating the turbine buckets with respect to speed of rotation to vary the time of stay of each element of the surface above the vapor source during a 360° rotation such that it is shortest when the leading edges and trailing edges are pointing towards the vapor source and longest when the concave and convex flanks are presented to it.

4,233,343

THREE-DIMENSIONAL DECORATIVE SURFACE

John C. Barker, Cowansville, and Ivan P. McLaughlin, Dunham, both of Canada, assignors to J. J. Barker Company Limited, Quebec, Canada

Filed Aug. 10, 1978, Ser. No. 932,548

Int. Cl.[3] B41M *3/00*

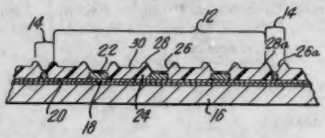
U.S. Cl. 427—264 **12 Claims**

1. A method of producing an article having a three-dimensional patterned surface comprising:

coating a flat surface of a substrate with a coloured printable base;

printing on said printable base a pattern composed of lines of a wet ink composition free of silicone oil;

applying to said printable base, over the pattern of wet ink lines, a liquid top coat composition of a resinous film forming material in a volatile organic solvent; said wet ink composition and said liquid top coat composition having differing surface tension properties such that said liquid top coat composition will retract from said wet ink lines;



allowing said liquid top coat composition to retract from the wet ink lines to form ridges of the liquid top coat composition adjacent the wet ink lines, and subsequently;

drying and baking the substrate to dry said ink lines and fix said liquid material as a hard resinous top coat defining a contour of valleys, hills and plains, said top coat remaining on the printed pattern in a thickness less than 1 mil.

4,233,344

METHOD OF IMPROVING THE ADHESION OF ELECTROLESS METAL DEPOSITS EMPLOYING COLLOIDAL COPPER ACTIVATOR

William Brasch, Commack, N.Y., assignor to LeaRonal, Inc., Freeport, N.Y.

Filed Jul. 20, 1978, Ser. No. 926,392

Int. Cl.[3] C23C *3/02*

U.S. Cl. 427—304 **5 Claims**

1. A method for promoting and improving the adhesion of an electroless metal deposit to the metal portion and a non-conductive portion which comprises treating the composite substrate with a copper type colloidal system to cause activation of the non-conductive portion thereof for electroless metal deposition, and thereafter treating the activated substrate, including the metal portions thereof, with an adhesion promoter compound selected from hydrazine hydrate, ammonium persulfate, or alkali hydroxide prior to the step of electroless deposition.

4,233,345

THIN-SKIN STABILIZATION OF PADS OF FLUFFED PULP

Robert T. Elias, Downers Grove, and Dennis C. Holtman, Orland Park, both of Ill., assignors to Johnson & Johnson Baby Products Company, New Brunswick, N.J.

Continuation-in-part of Ser. No. 943,277, Sep. 18, 1978, abandoned. This application Apr. 23, 1979, Ser. No. 32,181

Int. Cl.[2] B05D *3/00, 3/12*

U.S. Cl. 427—325 **9 Claims**

1. A method for stabilizing a high loft, low density air laid pad of short length fibers which comprises pretreating a surface of said pad with a light spray, at a level not higher than about 15 cc per sq. meter and not higher than about 5% of the weight per unit area of said pad of a solution of a coagulating material for a resin dispersion while maintaining substantially the entire interior of said pad dry, applying said resin dispersion to said pretreated surface thereby causing coagulation of said dispersion and limiting its penetration to the interior of said pad whereby a reinforcing layer is obtained on said pad while maintaining substantially its original high loft and absorptive capacity.

4,233,346

METHOD AND APPARATUS FOR APPLYING A PLURALITY OF SUPERPOSED LAYERS TO A WEB BY CURTAIN COATING

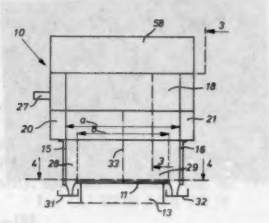
Jacques G. Kerkhofs, Diepenbeek, Belgium, assignor to AGFA-GEVAERT N.V., Mortsel, Belgium

Filed Feb. 26, 1979, Ser. No. 15,147

Claims priority, application United Kingdom, Mar. 1, 1978, 811578

Int. Cl.[2] B05D 1/30

U.S. Cl. 427—345 13 Claims



1. In a method of applying to a travelling web a plurality of layers of at least one flowable composition, comprising moving said web along a predetermined pathm, delivering such flowable compositions to a plurality of slot-like orifices to form a plurality of distinct flowing layers of such compositions, flowing said layers into face to face contact with one another to form a composite layer and delivering said composite layer as a free-falling curtain onto said web at a locus extending transversely of said path, said curtain being held in said locus by adherent contact of its lateral edges with curtain guides, said curtain falling on said moving web, the improvement wherein at least one of said plurality of layers has a width greater than the width of the web, and at least one of said plurality of layers has a width smaller than the overall width of the curtain whereby at least one but not all of said plurality of layers are in adherent contact with the curtain guides.

4,233,347

PROCESS FOR REINFORCING STRUCTURALLY FRAGILE INORGANIC FABRICS

Hong S. Lim, Agoura; Howard H. Rogers, Culver City, and Scott A. Verzwyvelt, Thousand Oaks, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Oct. 2, 1978, Ser. No. 948,119

Int. Cl.[3] B05D 3/00, 1/18, 3/02; H01M 2/16

U.S. Cl. 427—352 10 Claims

1. A process for reinforcing a porous fragile inorganic fabric to increase its mechanical strength without inhibiting the flow of gases there through or decreasing the wettability of said fabric comprising the steps of:

(a) first providing an impregnation solution of a thermosetting polymer and a strongly polar solvent;

(b) immersing said fabric in said solution until said fabric is saturated with said solution;

(c) removing said saturated fabric from said solution and blotting to remove excess solution from said fabric;

(d) causing said polymer to precipitate inside of the pores of said fabric from said solution, by treating said impregnated fabric with a hot liquid extractant characterized by exhibiting the property of being miscible with said polar solvent and immiscible with said polymer, thereby forming polymer particles about the fibers of said fabric which reinforce but do not coat said fabric; and

(e) removing said particle reinforced cloth from said liquid extractant and exposing said cloth to the drying action of hot air until dry.

4,233,348

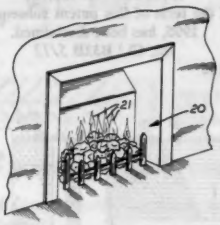
IMITATION COAL AND METHOD OF MAKING SAME

Nigel A. Corry, 38 Arthog Rd., Hale, Cheshire, England

Filed Apr. 4, 1979, Ser. No. 26,948

Int. Cl.[2] B44F 9/00

U.S. Cl. 428—15 7 Claims



1. An imitation coal element comprising: a raw ceramic bulk fibre mass which has been moistened with a heat-settable stiffening agent, squeezed into its desired coal lump shape and baked to set it into the desired shape of lump which has subsequently been coloured black by a two-stage colouring process each stage of which consists in impregnating the shaped mass with a black metallic oxide/colloidal sodium silicate impregnant and then baking the impregnated mass.

4,233,349

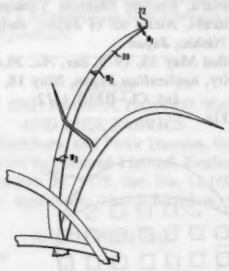
SUEDE-LIKE PRODUCT AND PROCESS THEREFOR

Donald O. Niederhauser, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 26, 1979, Ser. No. 23,967

Int. Cl.[2] B32B 3/02

U.S. Cl. 428—92 18 Claims



1. A suede-like fabric structure including a ground fabric comprising discrete fibrils, said fibrils extending as fibril ends from said ground fabric at randomly spaced points of attachment to form one surface of the suede-like fabric having a density of from about 5000 to about 100,000 fibril ends per square centimeter, the majority of said fibril ends being tapered and having an average tip width of less than 10μ when measured a distance of about 2μ from the terminal point of said fibril ends, said fibril ends tapering to said tip width from a greater trunk width, the average trunk width being about 1.5 to 10× greater than said average tip width when measured a distance of about 100μ from the terminal point of said fibril ends.

4,233,350

FORMAMINOUS SHEET

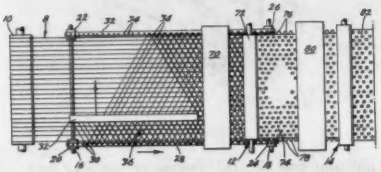
Frank L. Shiflet, Waynesboro, Va., assignor to Hopeman Brothers, Inc., Waynesboro, Va.

Continuation-in-part of Ser. No. 787,838, Apr. 15, 1977, Pat. No. 4,126,725, which is a continuation-in-part of Ser. No. 627,750, Oct. 31, 1975, Pat. No. 4,033,084. This application Oct. 19, 1978, Ser. No. 952,726

The portion of the term of this patent subsequent to Nov. 20, 1995, has been disclaimed.

Int. Cl.[3] B32B *5/12*

U.S. Cl. 428—110 4 Claims



1. In a high-pressure decorative laminate comprising a plurality of layers and adhesive means rigidly securing said layers together, a foraminous steel sheet located between two adjacent layers of said plurality and comprising three overlying groups of parallel steel filaments, the filaments in each group being non-parallel to the filaments in each of the other groups, the intersections of said filaments being flattened to an extent such that said sheet has a substantially uniform thickness except at the locations of its openings and in the immediate vicinity thereof, in which at least part of the adhesive means securing said two adjacent layers together extends through the openings in said foraminous sheet.

4,233,351

CERAMIC HONEYCOMB STRUCTURE

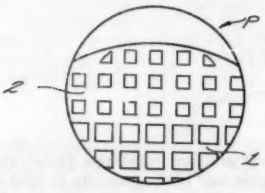
Kazunari Okumura, Kariya; Shinichi Yamamoto, Takahama, and Zituo Suzuki, Aichi, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed May 15, 1979, Ser. No. 39,442

Claims priority, application Japan, May 18, 1978, 53-59589

Int. Cl.[2] B32B *3/12*

U.S. Cl. 428—116 6 Claims



1. In a ceramic honeycomb structure provided with a plurality of open passages extending therethrough in an axial direction thereof and defined by thin walls of said structure

the improvement wherein:

the wall thickness of at least one part of walls of said structure which define said open passages formed in an annular portion along an outer peripheral surface of said structure is formed larger than that of the other open passages formed in portions other than said annular portion.

4,233,352

POLYESTER FILM AND METHOD OF MANUFACTURE THEREOF

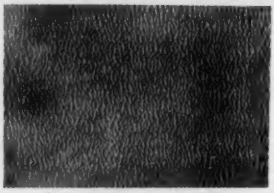
Masaaki Ono, Otsu; Kazuo Okabe, Kyoto, and Yasuki Miura, Otsu, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Jan. 9, 1979, Ser. No. 2,230

Claims priority, application Japan, Jan. 9, 1978, 53-518

Int. Cl.[3] H01F *10/02*

U.S. Cl. 428—141 39 Claims



1. A polyester film at least one surface of which is covered with worm-like nodules containing a mixture of an essentially water soluble polymer having a molecular weight of about 10,000–2,000,000 and at least one water emulsifiable polymer selected from the group consisting of (A) polysiloxane having a molecular weight of about 30,000–300,000 and (B) styrene butadiene rubber having a molecular weight of about 20,000–1,000,000, the weight ratio of said water soluble polymer to said water emulsifiable polymer in the mixture being about 1–100:5–50.

4,233,353

HIGH-STRENGTH BUILT-UP ROOFING USING IMPROVED GLASS FIBER MATS

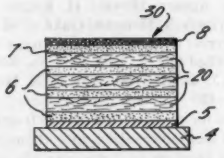
Alfredo A. Bondoc, Middlesex; V. Robert Canfield, Martinsville, and B. Randall Ziegler, Freehold, all of N.J., assignors to GAF Corporation, New York, N.Y.

Filed May 16, 1979, Ser. No. 39,575

The portion of the term of this patent subsequent to Nov. 11, 1997, has been disclaimed.

Int. Cl.[3] B32B *5/22, 17/02*

U.S. Cl. 428—141 6 Claims



1. A built-up roofing system comprising:

(a) multiple plies of high-strength built-up roofing membranes comprising:

(a') a high strength glass fiber mat which is formed from bundles of glass fibers by the wet-laid process, said fibers having a length of about 1¾ to 3 inches and a diameter of about 8 to 20 microns, comprising:

(i) a plurality of individual filament glass fibers comprising about 20% to 60% by weight of the fibrous material in said mat,

(ii) a plurality of extended glass fiber elements comprised of longitudinally connected fibers said elements there having a length which is greater than the length of the fibers in said element, and a diameter which is non-uniform, being greater in the mid-portion thereof than at its ends, said elements comprising

about 40% to 80% by weight of the fibrous material in said mat,

both said individual filament fibers and said extended fiber elements being substantially randomly oriented and uniformly dispersed throughout said material, and,

(iii) a binder substance to hold said fibrous material together, and,

(b') saturant asphalt impregnated in said mat, and

(b) adhesive asphaltic coatings between said membranes.

4,233,354

PRINTED POLYESTER FILMS

Kinji Hasegawa, Sagamihara; Yukio Mitsuishi, Machida, and Shigeyoshi Masuda, Sagamihara, all of Japan, assignors to Teijin Limited, Osaka, Japan

Filed Aug. 22, 1978, Ser. No. 935,850

Claims priority, application Japan, Aug. 30, 1977, 52-103170

Int. Cl.[2] B32B *5/16, 27/36*

U.S. Cl. 428—195 **9 Claims**

1. A printed polyester film comprising

(I) a biaxially oriented polyester film which is a blend of (1) a polyethylene glycol containing polyester with (2) a polyester comprising at least 80% by weight, based on the entire structural units, of ethylene terephthalate units, said blend containing from 2.1% to 5% by weight of the blend of said polyethylene glycol having a molecular weight in the range of from 10,000 to 100,000 and having a density in the range of from 1.392 g/cm^3 to 1.403/cm^3, and

(II) a printed layer formed by a printing ink containing a cellulose derivative as a binder, said printed layer being applied to at least a part of the surface of the film (I).

4,233,355

SEPARABLE COMPOSITE FIBER AND PROCESS FOR PRODUCING SAME

Yoshiaki Sato, and Hajime Arai, both of Mishima, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Mar. 6, 1979, Ser. No. 17,949

Claims priority, application Japan, Mar. 9, 1978, 53/26981; Sep. 14, 1978, 53/112379

Int. Cl.[3] D03D *15/00*

U.S. Cl. 428—224 **12 Claims**

1. A separable unitary composite fiber having a substantially uniformly shaped transverse cross-section along its length, said composite fiber being comprised of at least two different polymer components, one of which is soluble in a given solvent and the other of which is relatively insoluble in the given solvent, a plurality of segments of said relatively insoluble polymer component being isolated from each other by the intervening soluble polymer component in the transverse cross-section of the composite fiber,

said soluble polymer component being a polyester comprised of 80 to 97% by mole of ethylene terephthalate units and 3 to 20% by mole of ethylene 5-sodium-sulfoisophthalate units, and said relatively insoluble polymer component being a fiber-forming polymer selected from the group consisting of polyester and polyamide.

4,233,356

MATERIAL FOR WATERPROOFING BRIDGE DECKS AND THE LIKE

Melvin J. Jacobs, Sharon, Mass., assignor to Triram Corporation, Framingham, Mass.

Division of Ser. No. 803,789, Jun. 6, 1977, Pat. No. 4,151,025.

This application Mar. 8, 1979, Ser. No. 18,838

Int. Cl.[2] E01D *19/12*

U.S. Cl. 428—244 **7 Claims**

1. A membrane for use in waterproofing bridge decks or the like, comprising

(a) a first ply of a cured flexible elastomer, defining one side of said membrane,

(b) a second ply of an uncured flexible elastomer, defining the opposite side of said membrane, and

(c) a third ply of flexible fabric of open mesh weave laminated between said first and second plies,

(d) said second ply being a soft, uncured, form stable elastomer adapted to flow when heated.

4,233,357

LAMINATED INSULATING BOARD

Rodney Taylor, Broadway; Robert J. Pragnell, and John P. Sheppard, both of Cheltenham, all of England, assignors to Coal Industry (Patents) Limited, London, England

Filed Sep. 6, 1979, Ser. No. 73,026

Int. Cl.[2] B32B *5/18*

U.S. Cl. 428—245 **5 Claims**

1. A laminated insulating board comprising an insulating core of foamed phenol-formaldehyde resin which has a closed cell content of at least 85% and on least one face of said core a glass fibre woven or non-woven cloth or tissue laminated to the core with a water-based natural rubber latex adhesive, the laminate having a water absorption of not more than 10% v/v, a thermal conductivity (k-value) of less than 0.035 W/m°C., a flexural strength of at least 50×10^4 N/m^2, a tensile strength of at least 30×10^4 N/m^2, a compressive strength of at least 20×10^4 N/m^2 and a delamination peel strength of at least 200 N/m at room temperature.

4,233,358

METHOD FOR THE PRODUCTION OF WATERPROOF AND LIKE FABRICS

Norman Jones, Blackburn, and Peter Dawson, Darwen, both of England, assignors to Clemead Limited, England

Filed Feb. 21, 1979, Ser. No. 13,169

Claims priority, application United Kingdom, Oct. 13, 1978, 40583/78

Int. Cl.[2] B32B *7/00*

U.S. Cl. 428—246 **14 Claims**

9. A waterproof stretchable coated textile fabric produced by the method comprising the steps of:

(a) applying plural layers of coating material to an elongate, flexible carrier element having a release capability in relation to the coating material, the respective formulations of the successive layers and the application thereof

to the immediately preceding layer existing on the carrier element being such that a given coating layer will fuse with the free surface and immediately adjacent parts of such preceding layer;

(b) contacting a surface of a length of a textile fabric formed wholly of continuous filament synthetic yarns with said layers of coating material on said carrier element, and

(c) tensioning a run of said carrier element carrying said layers and a textile fabric run so that said textile fabric run is also tensioned, the tensioning of said carrier element run creating laminating pressure between said textile fabric run and carrier element run so that said layers are transferred to the textile fabric and said layers and textile fabric are laminated together to form a laminate.

4,233,359
LEATHERY SHEET MATERIAL AND PROCESS FOR THE PREPARATION THEREOF

Masahisa Mimura, Mihara; Isamu Nakano, Takehara; Nobuo Okawa, Mihara, and Atsushi Tanaka, Fuchu, all of Japan, assignors to Teijin Limited, Osaka, Japan

Filed Nov. 8, 1978, Ser. No. 958,906
Claims priority, application Japan, Nov. 8, 1977, 52-133084
Int. Cl.[3] B32B *27/40*
U.S. Cl. 428—254 **11 Claims**

1. A leathery sheet material having excellent flexibility, antistatic properties and soil resistance which comprises (1) a fibrous mat and (2) a polyurethane composition applied all over said mat in an amount of 10 to 80% by weight based on the total weight of said mat and said polyurethane composition, said polyurethane composition containing 0.1 to 5.0% by weight of a surface active agent based on said polyurethane composition, said surface active agent having a molecular weight of 2,500 to 30,000 and comprising 30 to 80% by weight of a hydrophilic component based on said surface active agent and a hydrophobic component, both the components being combined by a urethane bond and/or an amide bond, said hydrophilic component comprising polyethylene oxides and said hydrophobic component comprising a member selected from the group consisting of (a) polyalkylene oxides excepting polyethylene oxides, (b) aliphatic polyesters and (c) mixtures thereof.

4,233,360
NON-ANTIGENIC COLLAGEN AND ARTICLES OF MANUFACTURE

Edward E. Luck, and John R. Daniels, both of Menlo Park, Calif., assignors to Collagen Corporation, Palo Alto, Calif.

Division of Ser. No. 744,536, Nov. 24, 1976, Pat. No. 4,140,537, which is a continuation of Ser. No. 624,678, Nov. 22, 1975, abandoned. This application Sep. 25, 1978, Ser. No. 945,723
Int. Cl.[2] B32B *5/26*; A61L *15/04*; C08L *89/06*
U.S. Cl. 428—310 **5 Claims**

1. A method for preparing an atelopeptide collagen burn dressing comprising a laminate of a foam and a film which comprises:

lyophilizing a dispersion of fibers of atelopeptide collagen to form a foam;

cross-linking said foam;

applying an aqueous dispersion of a mixture of cross-linked and non-cross-linked atelopeptide collagen to said foam to form a laminate; and

dehydrating said laminate, wherein said dispersion of fibers of atelopeptide collagen is prepared by inducing slow desolubilization of atelopeptide collagen from an aqueous solution of atelopeptide collagen while subjecting said solution to mild shear force, whereby fibers of atelopeptide collagen are formed having a mean diameter of at least about 500 nm and appearing as a rope-like structure in a scanning electron micrograph.

4,233,361
PANEL AND METHOD FOR THE PREPARATION THEREOF

Duane A. Fultz, Westerville, Ohio, assignor to The Dow Chemical Company, Midland, Mich.

Filed Jul. 27, 1978, Ser. No. 928,482
Int. Cl.[2] B32B *3/26, 5/18, 19/02, 27/42*
U.S. Cl. 428—313 **6 Claims**

1. A composite synthetic resinous foam panel, the foam panel having at least first and second generally opposed major surfaces, the resinous panel comprising a plurality of expanded multicellular synthetic resinous thermoplastic particles, the particles having a density of from about one-half to two pounds per cubic foot, the synthetic resinous thermoplastic particles being generally encapsulated within a matrix of a resole resin foam, the resole resin foam having a bulk density in the interstitial spaces between the synthetic resinous particles of from about two to six pounds per cubic foot, an expanded glass in particulate form encapsulated within portions of the resole resin foam disposed adjacent the major surfaces of the panel.

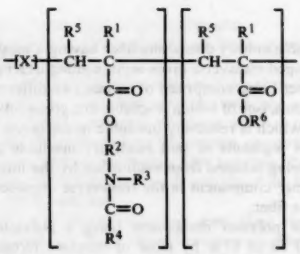
4. The panel of claim 1 wherein an aluminum sheet is disposed on and adhered to at least one major surface thereof.

4,233,362
WATER-SOLUBLE AIR-OXIDIZING ACRYLIC COATINGS

Ronald W. Novak, Hatfield, and Benjamin B. Kine, Elkins Park, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 783,587, Mar. 1, 1977, abandoned, which is a continuation-in-part of Ser. No. 751,507, Dec. 17, 1976, abandoned. This application Dec. 18, 1978, Ser. No. 970,717
Int. Cl.[2] B05D *3/02*; B32B *17/10, 19/04, 15/08*
U.S. Cl. 428—332 **26 Claims**

1. In a method of coating an article with a paint containing an aqueous alkaline solution of an addition polymer solubilized in said solution by a volatile amine or ammonia, said solubilized polymer having the structure:



I

wherein

R^1 is H, a lower alkyl radical having one to five carbon atoms, halogen, —CN, or —CH_2COOR, —COOR, or

—CH_2COOH, R being a lower alkyl radical having from one to eight carbon atoms;

R^2 is $(CR^7_2)_n$ wherein R^7 is —H or $—CH_3$ and n is 1 or 2;

R^3 is H, or a lower alkyl radical having from one to 8 carbon atoms;

R^4 is an unsaturated, air-curable alkyl radical;

R^5 is H, —COOH, $—CONH_2$, or —COOR, wherein R is as above;

R^6 is H, or an aliphatic or cycloaliphatic radical having from one to 20 carbon atoms; and

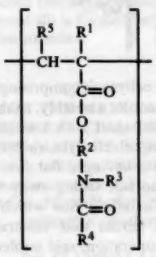
X is optional and when present is derived from at least one vinyl monomer different than the residues depicted;

the units in brackets being in any order, portions of the R^6 radicals being as hereinafter defined in units of the formula:

II

R^6 being H in a sufficient number of units of Formula II to provide the polymer with a carboxy content of 0.5–6 meq/g. of polymer, the quantity of carboxy groups being sufficient, when in the form of salt groups with said amine or ammonia, to confer water solubility upon the polymer, the amount of carboxy-containing units of Formula II wherein R^6 is H being between 5 and 40 parts by weight of the total polymer; optionally a portion of the radical R^6 in the units of Formula II being at least one aliphatic or cycloaliphatic radical and being selected so that the units are derived from at least one ester which when homopolymerized gives a high molecular weight polymer having a T_g of between −80° C. and 120° C., said ester units forming up to 90 parts by weight of the polymer; the polymer having between about 5 and 60 parts by weight of units of the formula:

V



wherein R^1, R^2, R^3, R^4, and R^5 are as identified above, any balance of the polymer being the units of —X— of addition polymerized ethylenically unsaturated monomers other than said units of Formulas II and V, the total parts of all said units being 100, the Mv of the polymer being between about 5,000 and 200,000, the T_g of a cured film of the polymer being between about −20° C. and 80° C., the Tukon Hardness of the cured film being between about 0.2 and about 15, in which the composition optionally includes a metal compound drier in an amount up to 0.5%, on a metal basis, of the total polymer weight in the composition, applying a thin uniform coating of the aqueous solution to a substrate, and drying and curing said coating in the presence of air.

10. An article of manufacture prepared by the method of claim **1**, **2**, **3**, **4**, **5**, **6**, **7**, **8**, or **9**, in which the cured coating is from 0.1 mil to 10 mils in thickness, the Tukon hardness of the cured film being between about 0.2 and about 15.

4,233,363

POLYESTER DRAW-TEXTURING FEED YARNS

Albert Cemel; Castulo Chaban, Jr., both of Chattanooga, Tenn., and Albert Z. Fresco, Martinsville, Va., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 2, 1979, Ser. No. 17,072

Int. Cl.² D02G *3/00*

U.S. Cl. 428—373 **5 Claims**

1. A draw-texturing feed yarn with the improvement, whereby the feed yarn may be draw-textured to provide a textured yarn for making fabric having a fine uniform heather appearance, that the yarn comprises polyester spin-oriented filaments (a) of one type having affinity for one class of dyestuffs, and (b) of another type having affinity for a different class of dyestuffs, that the degree of component mixing (DCM) of the different types of filaments is at least 50%, and that the stress ratio (SR) of the different types of filaments is about 0.8 to about 1.2.

4,233,364

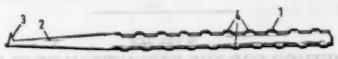
ANCHORING FIBRE FOR USE IN CONCRETE

Rudolphus A. F. J. van Thiel, Beek en Donk, Netherlands, assignor to Van Thiel's Draadindustrie (Thibodraad) B.V., Beek en Donk, Netherlands

Continuation-in-part of Ser. No. 927,953, Jul. 25, 1978, abandoned. This application May 15, 1979, Ser. No. 39,211

Int. Cl.² D02G *3/00*

U.S. Cl. 428—399 **11 Claims**



1. An anchoring fibre of metal for use in concrete comprising a longitudinally extending cylindrical body, said fibre having means thereon to resist pull-out thereof from the concrete, said means comprising the end portions of the fibre being flattened, and a projection on a said flattened end portion, said projection extending transversely of the axis of said body.

4,233,365

FREE FLOWING PARTICLES OF ELASTOMERIC MATERIAL AND METHOD

Rudolph F. Karg, Baton Rouge, La., assignor to Copolymer Rubber & Chemical Corp., Baton Rouge, La.

Division of Ser. No. 791,696, Apr. 28, 1977, Pat. No. 4,183,887. This application Apr. 6, 1979, Ser. No. 27,983

Int. Cl.² B32B *5/16*

U.S. Cl. 428—404 **6 Claims**

1. Free flowing particles of elastomeric material comprising particles of elastomeric material, a porous network of fibrilated synthetic resinous material on the surface of the elastomeric particle, and finely divided solid particles of partitioning agent entrapped for retention by the fibrilated synthetic resinous network to maintain separation for free flow of the elastomeric particles.

4,233,366

SILANE COATED SILICATE MINERALS AND METHOD FOR PREPARING SAME

Thomas E. Sample, Jr., and John M. Horn, both of Houston, Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Division of Ser. No. 772,380, Feb. 28, 1977, Pat. No. 4,137,367, which is a continuation-in-part of Ser. No. 637,339, Dec. 3, 1975, abandoned, which is a continuation of Ser. No. 513,984, Oct. 11, 1974, abandoned. This application Oct. 23, 1978, Ser. No. 954,389

Int. Cl.[2] B32B *5/16*

U.S. Cl. 428—405 **5 Claims**

1. A composition of matter consisting of a phyllosilicate mineral including a superficial octahedral layer of magnesium oxide that has been processed by the steps of:

(a) etching said mineral with an acid;

(b) arresting such etching process when said superficial layer has been solubilized; and

(c) subsequently reacting the etched phyllosilicate with an organo-silane.

4,233,367

COEXTRUDED MULTILAYER FILM

William G. Ticknor, Appleton, and Arnold R. Rein, Menasha, both of Wis., assignors to American Can Company, Greenwich, Conn.

Filed Jan. 6, 1977, Ser. No. 757,140

Int. Cl.[3] B32B *27/08*

U.S. Cl. 428—476.3 **11 Claims**

1. A process for producing a multilayer film, comprising: coextruding nylon and a chemically modified polyolefin selected from the group consisting of ethylene vinyl acetate polymer, high density polyethylene and rubber modified high density polyethylene, each chemically modified by the provision of functional groups to the polymer which have a strong affinity for nylon and which will form a strong bond to nylon under heat and pressure of coextrusion.

5. A multilayer film comprising: a coextrusion of nylon and a chemically modified polyolefin selected from the group consisting of ethylene vinyl acetate polymer, high density polyethylene, and rubber modified high density polyethylene, each chemically modified by the provision of functional groups to the polymer which have a strong affinity for nylon and which will form strong bonds to nylon under the heat and pressure of coextrusion.

4,233,368

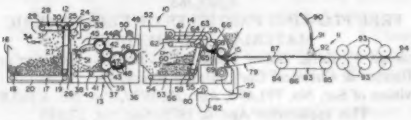
METHOD FOR THE PRODUCTION OF GLASS FIBER-REINFORCED GYPSUM SHEETS AND GYPSUM BOARD FORMED THEREFROM

Donald O. Baehr, Arlington Heights, and David G. Izard, Hoffman Estates, both of Ill., assignors to United States Gypsum Company, Chicago, Ill.

Filed Jun. 5, 1978, Ser. No. 912,776

Int. Cl.[3] B28B *3/00*; B32B *9/04*; C04B *43/02*

U.S. Cl. 428—538 **32 Claims**



17. A cementitious construction sheet having reinforcing fibers dispersed therein, said sheet being the product formed by the method which comprises:

(a) mixing together in a moving air current generated by an air blower a substantially dry water-settable calcium sulfate hemihydrate in finely particulate form with reinforcing glass fibers,

(b) providing a foraminous moving surface,

(c) depositing the mixture of calcium sulfate hemihydrate and glass fibers on said foraminous surface to form a sheet,

(d) applying water over the sheet,

(e) permitting the calcium sulfate hemihydrate to set, and

(f) drying said sheet to remove any excess water.

4,233,369

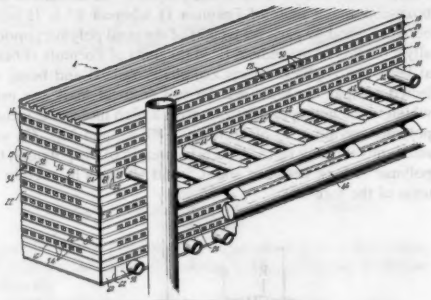
FUEL CELL COOLER ASSEMBLY AND EDGE SEAL MEANS THEREFOR

Richard D. Breault, Coventry; Richard J. Roethlein, Stafford Springs, and Joseph V. Congdon, Glastonbury, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Oct. 29, 1979, Ser. No. 88,994

Int. Cl.[3] H01M *8/04*

U.S. Cl. 429—26 **3 Claims**



1. An electrochemical cell stack comprising first and second fuel cells separated by a cooler assembly, each cell comprising a pair of electrodes spaced apart with a matrix layer disposed therebetween for retaining electrolyte, each electrode including a gas porous substrate having a flat first side facing said matrix layer and a second side facing away from said matrix layer said second side including ribs which define grooves therebetween extending across said substrate for carrying reactant gas during cell operation, said cooler assembly comprising a top and a bottom gas impervious graphite plate, said plates spaced apart with a gas porous, graphitized, resin bonded, carbon fiber tube holder disposed therebetween, each of said plates having first and second oppositely facing surfaces, said holder having a bottom surface contiguous with and resin bonded to said first surface of said bottom plate and a top oppositely facing surface contiguous with said first surface of said top plate, a plurality of parallel channels in said top surface of said holder, said channels extending across the length of said holder and parallel to said grooves in one of said electrodes, said cooler assembly including tubes disposed in said channels and passing through said holder for carrying a coolant into heat exchange relationship with said cells, said channels having a depth which is substantially the same as the full thickness of said holder and as the outer diameter of said tubes, said cooler assembly also including gas seal means disposed between said plates along each edge of said holder parallel to said channels to prevent gas leakage from said holder through said edges.

4,233,370

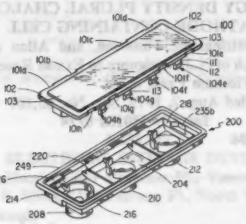
SNAP-THROUGH ANTI-IGNITION VENT CAP FOR LEAD ACID STORAGE BATTERIES

Joseph I. Heiser, Wyomissing Hills, and Edgar M. Erb, Lancaster, both of Pa., assignors to General Battery Corporation, Reading, Pa.

Continuation-in-part of Ser. No. 879,461, Feb. 21, 1978, which is a division of Ser. No. 744,647, Nov. 24, 1976, Pat. No. 4,086,395, which is a continuation-in-part of Ser. No. 593,546, Jul. 7, 1975, abandoned. This application Apr. 30, 1979, Ser. No. 34,416

Int. Cl.³ H01M 2/12

U.S. Cl. 429—82 4 Claims



1. A vent cap for use on an electric storage battery to sealingly engage the openings of said battery and to vent battery gases to the atmosphere, said vent cap comprising:

(a) a bottom member adapted to sealingly fit into said openings in said battery and to communicate the interior of said battery to the atmosphere, said bottom member having at least one slot through the underside thereof and an annular sidewall;

(b) a top member fitted within said annular sidewall and snap-fitted through said slot in said bottom member, said top member having at least one prong member extending downward therefrom through said slot, and said prong member being narrower than said slot, whereby at least one first slit is formed between said slot and said prong on the underside of said bottom member;

(c) said top member further having at least one indentation in the circumference thereof adjacent said annular sidewall, whereby a second slit is formed between said top member and said bottom member.

4,233,371

METHOD FOR THE MANUFACTURE OF AN ELECTROCHEMICAL CELL OR BATTERY AND BATTERY MADE BY THE METHOD

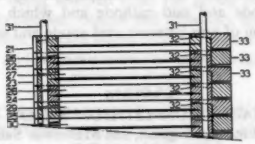
Antoon Dorrestijn, Grevenbicht, Netherlands, assignor to Electrochemische Energieconversie N.V., Mol, Belgium

Filed Sep. 10, 1979, Ser. No. 74,099

Claims priority, application Netherlands, Sep. 13, 1978, 7809298

Int. Cl.³ H01M 6/46

U.S. Cl. 429—152 12 Claims



1. A method for the manufacture of an electrochemical cell or battery, consisting of a stack of plate-shaped elements, including at least two electrode elements, each of which consists of a sheet or plate of electrode material which is mounted in a frame made of an electrically insulating fibrous-web material impregnated with a thermosetting synthetic material, which elements, prior to setting, are stacked to form a package of the desired composition in such a way that gas or liquid chambers are formed between the elements, after which the stack is subjected to a compression molding operation at a temperature causing the thermosetting synthetic material to polymerize, thus forming the stack into a coherent block, wherein the improvement comprises the steps of employing a first compression molding operation stage wherein the individual plate-shaped elements are manufactured by placing a sheet of electrode material in a press mold between frame sections made of electrically insulating fibrous web impregnated with a non-polymerized thermosetting synthetic material and heating the assembly under pressure for a relatively short primary time at a relatively low primary temperature, at which temperature the thermosetting synthetic material flows well, but polymerizes only to a minor degree at most, after which the resulting plate-shaped elements, together with any other cell or battery components, are stacked into a package of the desired composition, which package in a second compression molding operation stage is formed into a coherent block by compressing it for a relatively long secondary time and at a relatively high secondary temperature, at which the thermosetting synthetic material sets.

12. An electrochemical cell or battery constructed in accordance with claim 1 or 2.

4,233,372

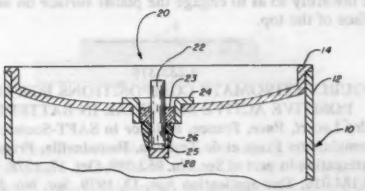
HERMETIC SEAL FOR ELECTROCHEMICAL CELL

Per Bro, Andover, and George Wallis, Lexington, both of Mass., assignors to P. R. Mallory & Co. Inc., Indianapolis, Ind.

Filed May 9, 1979, Ser. No. 37,556

Int. Cl.³ H01M 2/00

U.S. Cl. 429—174 21 Claims

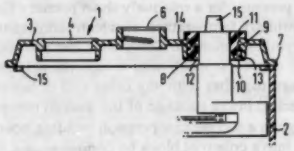


1. An electrochemical cell comprising a container closed with an hermetic seal, said seal comprising a first metal member separated from a second metal member and sealed thereto by a glass member, said first and second metal members being electrically insulated from each other by said glass member, characterized in that said second metal member is chemically incompatible with components of said cell, and said second metal member is mechanically and electrically connected to a third metal member, chemically compatible with components of said cell, and exposed thereto, said third metal member being electrically connected to an electrode of said cell to provide electrical continuity between said electrode and said second metal member and said seal further including means for sealingly enclosing substantially all of the surfaces of said second metal member which are exposed within said cell container.

4,233,373
CELL CASING AND GROMMET THEREFORE

Ian Meyler-Warlow, and Graham H. Law, both of Redditch, England, assignors to Heatherbourne Plastics Limited, England

Filed Apr. 11, 1979, Ser. No. 29,252
Claims priority, application United Kingdom, Apr. 12, 1978, 14339/78
Int. Cl.³ H01M 2/30
U.S. Cl. 429—181 2 Claims

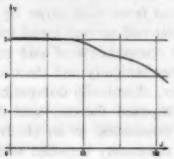


1. An electric cell comprising a casing having a bottom, side walls and a top, said top having an inner and an outer surface, a plurality of holes in the top, a terminal post protruding through each hole, an inclined surface on the outer surface of the top and about each hole, a planar surface portion on the inner surface of the top about each hole and extending substantially perpendicular to the axis of the respective hole, and a grommet located in each hole sealing between the respective terminal post and the top, the grommets each including a body, an opening through the body through which the respective terminal post passes, and a peripheral groove about the body defining spaced first and second peripheral lips, said first peripheral lip engaging on the planar surface portion of the inner surface of the top, said second peripheral lip engaging on the outer surface of the top, said opening including a cylindrical portion aligned with said second peripheral lip merging into a portion of increased width aligned with the first peripheral lip, and said first peripheral lip tapering away from the peripheral groove thereby providing an annular inwardly-inclined surface, the inwardly-inclined surface on the first peripheral lip during fitting cooperating with the inclined surface on the top to facilitate insertion of the grommet, and the portion of the opening of increased width permitting the first peripheral lip to flex inwardly so as to engage the planar surface on said inner surface of the top.

4,233,374
DOUBLE CHROMATE COMPOSITIONS FOR USE AS POSITIVE ACTIVE MATERIAL IN BATTERIES

André Lecerf, Pace, France, assignor to SAFT-Societe des Accumulateurs Fixes et de Traction, Romainville, France

Continuation-in-part of Ser. No. 952,089, Oct. 17, 1978, Pat. No. 4,184,016. This application Apr. 13, 1979, Ser. No. 30,051
Claims priority, application France, Feb. 14, 1979, 79 03772; Apr. 2, 1979, 79 08198
Int. Cl.³ H01M 6/14
U.S. Cl. 429—194 7 Claims



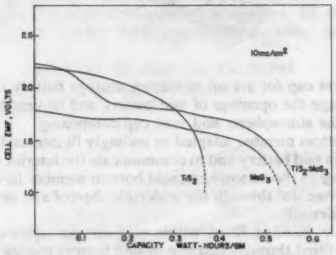
1. A composition comprising a double chromate of bismuth taken from the group consisting of $AgBi(CrO_x)_2$, $AgBi(Cr_2O_7)_2$, $TlBi(CrO_4)_2$, and $TlBi(Cr_2O_7)_2$, where x is equal to or greater than 3.7 and less than 4.

2. A battery having a positive electrode, a negative electrode selected from the group consisting of alkaline metals and alkaline earth metals and a nonaqueous electrolyte, wherein the positive electrode comprises as active material a double chromate of bismuth taken from the group consisting of $AgBi(CrO_x)_2$, $AgBi(Cr_2O_7)_2$, $TlBi(CrO_4)_2$, and $TlBi(Cr_2O_7)_2$, where x is equal to or greater than 3.7 and less than 4.

4,233,375
HIGH ENERGY DENSITY PLURAL CHALCOGENIDE CATHODE-CONTAINING CELL

M. Stanley Whittingham, Fanwood, and Allan J. Jacobson, Princeton, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Aug. 2, 1979, Ser. No. 63,107
Int. Cl.³ H01M 6/14
U.S. Cl. 429—194 31 Claims



1. An electric current producing cell, comprising:

(a) an anode having as its anode-active material one or more metals selected from the group consisting of the Periodic Table Group IA metals, Group IB metals, Group IIA metals and Group IIB metals;

(b) a cathode having as its cathode-active material a mixture containing:

(i) one or more cathode-active, high energy density chalcogenide compounds selected from the group consisting of VS_a, VO_a, partially substituted analogs of VS_a, C_xS, MoO_z and MoS_z, wherein a is a numerical value of about 1.8 to about 2.7, wherein x is a numerical value of about 4 to about 16, wherein z is a numerical value of about 2.5 to about 3.5; and

(ii) one or more cathode-active, high rate, high conductivity chalcogenide compounds selected from the group consisting of TiS_y, $TiSe_y$ and VSe_y, wherein y is numerical value of about 1.8 to about 2.2; and

(c) an electrolyte which is chemically inert with respect to said anode and said cathode and which permits the migration of ions between said anode and said cathode.

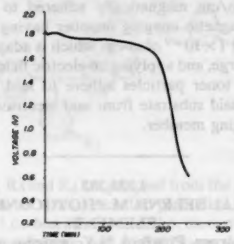
4,233,376
MAGNESIUM-LITHIUM ALLOY

James T. N. Atkinson, Kingston, and Maheswar Sahoo, Ottawa, both of Canada, assignors to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Ottawa, Canada

Filed Jan. 30, 1979, Ser. No. 8,690
Claims priority, application Canada, Feb. 14, 1978, 297104
Int. Cl.³ H01M 6/04
U.S. Cl. 429—199 6 Claims

1. An electrical battery comprising an anode, a manganese dioxide cathode and an aqueous magnesium perchlorate elec-

trolyte, wherein the anode is made of a magnesium-based alloy, the alloy consisting essentially of 6–13%/w of lithium,



0–1.5%/w of aluminum, the balance being magnesium and impurities.

4,233,377

ELECTRICAL STORAGE DEVICE

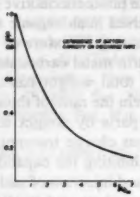
Rudolph R. Haering, 647 Croydon Pl., Vancouver, B.C., and James A. R. Stiles, 4133 Fairway Pl., North Vancouver, B.C., both of Canada

Filed Jul. 6, 1978, Ser. No. 922,199

Claims priority, application Canada, Jul. 14, 1977, 282696

Int. Cl.³ H01M *4/58*

U.S. Cl. 429—218 **17 Claims**



1. A battery comprising:

(a) an anode consisting essentially of a material selected from the group consisting of lithium and magnesium,

(b) a cathode consisting essentially of a layered transition metal dichalcogenide which has been pretreated by intercalating a relatively small amount of a suitable selected dopant having a relatively large atomic molecular or ionic radius with respect to the radius of cations migrating to and intercalating in the cathode during discharge of the battery, so as to permit more rapid intercalation of the cathode by said cations, said layered transition metal dichalcogenide being selected from the group consisting of molybdenum disulphide and titanium disulphide, said dopant being selected from the group consisting of sodium, potassium, cesium and rubidium, and

(c) a suitable selected liquid electrolyte in which the migration of said cations occurs during discharge of the battery.

4,233,378

PROCESS FOR MANUFACTURE OF POSITIVE ELECTRODE FOR LITHIUM/METAL SULFIDE SECONDARY CELL

Louis A. Joo', and Frederick C. Miller, both of Johnson City, Tenn., assignors to Great Lakes Carbon Corporation, New York, N.Y.

Continuation of Ser. No. 838,757, Oct. 3, 1977, abandoned. This application Dec. 11, 1978, Ser. No. 968,571

Int. Cl.² H01M *4/36*

U.S. Cl. 429—220 **5 Claims**

1. In a positive electrode for a high-temperature secondary electrochemical cell which uses a positive electrode, a lithium or lithium alloy negative electrode, a molten salt electrolyte containing lithium ions, and a porous separator, and wherein the active material of said positive electrode is a metal sulfide or a metal oxide or mixture thereof 100% of which passes through a 100 mesh per inch screen, and being selected from the group consisting of the sulfides and oxides of iron, copper, cobalt, and nickel deposited within a preformed solid continuous carbonaceous matrix selected from the group consisting of: graphite felts; carbon fiber felts; and carbonaceous foams with a void volume of from 50 to 95%, the improvement wherein said active material is bonded in place in said preformed matrix by the carbonized residue of a high carbon yield resin.

4,233,379

SEPARATOR FOR STARVED ELECTROLYTE LEAD/ACID BATTERY

Stephen E. Gross; Clifford W. Cain, Jr., both of Littleton; Paul D. Bilawsky, Lakewood, and Norman B. Scheffel, Parker, all of Colo., assignors to Johns-Manville Corporation, Denver, Colo.

Continuation-in-part of Ser. No. 19,805, Mar. 12, 1979, abandoned. This application May 17, 1979, Ser. No. 39,708

Int. Cl.³ H01M *2/16*

U.S. Cl. 429—247 **12 Claims**

1. A composition, useful as a separator material in starved electrolyte lead/acid batteries, which comprises a mixture of 30% to 80% by weight of expanded perlite and 20% to 70% by weight of glass fiber, said glass fibers having diameters in the range of from about 0.3 to about 1.0 micrometers and said perlite having particle sizes in the range of from about 3 to about 100 micrometers.

4,233,380

PROCESS FOR SHAPING A THERMOPLASTIC LAYER

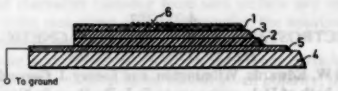
Roland Moraw, and Günther Schädlich, both of Naurod, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 588,564, Jun. 19, 1975, abandoned, which is a continuation of Ser. No. 341,335, Mar. 15, 1973, abandoned. This application May 3, 1978, Ser. No. 902,538

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1972, 2212968

Int. Cl.² G03G *16/00*; G03H *1/04*

U.S. Cl. 430—2 **6 Claims**



1. A process for recording a phase hologram in the form of a relief structure of an optical image on a recording material composed of a photoconductive thermoplastic recording layer and an electrically non-conductive transparent flexible base layer comprising

placing the flexible recording material which is separated by an intermediate layer on a planar, transparent, rigid base on the surface of which latter is disposed an electrically conductive layer, which is grounded,

electrostatically charging the photoconductive thermoplastic layer, whereby said flexible recording material is firmly and immovably electrostatically attracted onto said rigid base, the electrostatic attraction being effected by said electrostatic charging;

holographically exposing the charged flexible recording material on the rigid base with interference patterns of light of said optical image; and

softening by heat at least the surface of the charged and exposed flexible recording material on said rigid base by application of a voltage to opposite edges of the electrically conductive layer of said rigid base to thereby deform

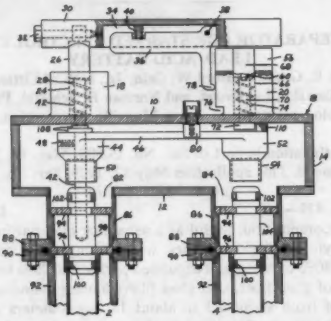
said photoconductive thermoplastic recording layer to said relief structure.

4,233,381

METHOD AND APPARATUS FOR INCREASING THE APPARENT RESOLUTION OF DEVELOPED ELECTROPHOTOGRAPHICALLY REPRODUCED IMAGES

Benzion Landa, Edmonton, Canada, assignor to Savin Corporation, Valhalla, N.Y.

Filed Nov. 9, 1978, Ser. No. 958,979
Int. Cl.[2] G03G *13/22*
U.S. Cl. 430—33 **3 Claims**



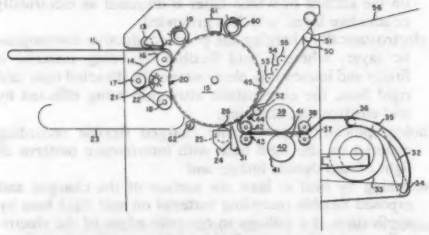
1. In a method of electrophotography in which a photoconductor is charged in a charging step, subjected to a light and shape image of a document to be copied to produce a latent electrostatic image of the document on the surface of the photoconductor in an exposing step, the latent electrostatic image is developed by a liquid-carried toner to provide a visible image on the photoconductor in a development step, and the visible image is transferred to a carrier sheet after it has been developed in a transferring step, the improvement comprising flooding the front of the visible electrostatic image with blanket light to increase the apparent resolution of the developed image before it is transferred to a carrier sheet and then practicing the transferring step.

4,233,382

ELECTROSTATIC TRANSFER OF MAGNETICALLY HELD TONER IMAGES

Donald W. Edwards, Wilmington, and Emery J. Gorondy, Rockland, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 767,511, Feb. 14, 1977, abandoned, which is a continuation-in-part of Ser. No. 672,551, Mar. 31, 1976, abandoned. This application Oct. 27, 1978, Ser. No. 955,506
Int. Cl.[2] G03G *19/00*
U.S. Cl. 430—39 **18 Claims**



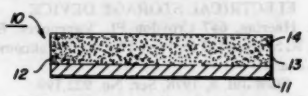
1. A process comprising bringing a substrate capable of maintaining an electrostatic charge into superposed position and intimate contact with an image of uncharged toner particles which have an electrical conductivity of less than about 1×10^{-13} mho/cm magnetically adhered to an electrically conductive magnetic imaging member having a resistivity of less than about $1\times10^{+9}$ ohm-cm which is adapted to dissipate an electric charge, and applying an electric field at this position whereby said toner particles adhere to said substrate upon separation of said substrate from said electrically conductive magnetic imaging member.

4,233,383

TRIGONAL SELENIUM PHOTOCONDUCTIVE ELEMENT

Anthony M. Horgan, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 29, 1979, Ser. No. 43,066
Int. Cl.[3] G03G *5/04*
U.S. Cl. 430—58 **16 Claims**



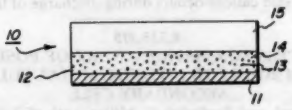
8. An imaging member comprising a charge generation layer comprising a particulate photoconductive material comprising trigonal selenium dispersed in an organic resinous binder, said trigonal selenium containing a mixture of alkaline earth metal selenite and alkaline earth metal carbonate of from about 0.01 to about 12.0 percent total weight based on the weight of trigonal selenium wherein the ratio of the selenite to carbonate ranges from 90 to 10 parts by weight to 10 to 90 parts by weight and a contiguous charge transport layer, said photoconductive material exhibiting the capability of photogeneration of charge carriers and injection of said charge carriers and said charge transport layer being substantially nonabsorbing in the spectral region at which the photoconductive material generates and injects photo-generated charge carriers but being capable of supporting the injection of photogenerated charge carriers from said photoconductive material and transporting said charge carriers through said charge transport layer.

4,233,384

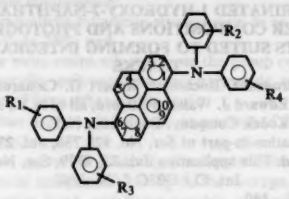
IMAGING SYSTEM USING NOVEL CHARGE TRANSPORT LAYER

S. Richard Turner; John F. Yanus, both of Webster, and Damodar M. Pai, Fairport, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 30, 1979, Ser. No. 34,817
Int. Cl.[3] G03G *5/04*
U.S. Cl. 430—59 **6 Claims**



1. An imaging member comprising a charge generation layer comprising a layer of photoconductive material and in contact therewith a charge transport layer of a polycarbonate resin material having dispersed therein from about 25 to about 75 percent by weight of one or more compounds having the general formula:



wherein R_1, R_2, R_3 and R_4 are selected from the group consisting of hydrogen, an ortho, meta or para alkyl group having from 1to about 4 carbon atoms, an ortho, meta or para halogen atom, a para phenyl group and combinations thereof, at least two of the four N substituents must in turn be substituted with said alkyl group, said halogen atom or said para phenyl group or a combination of these substituents, said photoconductive layer exhibiting the capability of photogeneration of holes and injection of said holes and said charge transport layer being substantially nonabsorbng in the spectral region at which the photoconductive layer generates and injects photogenerated holes, but being capable of supporting the injection of photogenerated holes from said photoconductive layer and transporting said holes through said charge transport layer.

4,233,385

METHOD AND APPARATUS FOR LIQUID ELECTROSTATIC DEVELOPMENT OF CHARGE IMAGES ON A TAPE-LIKE RECORD CARRIER

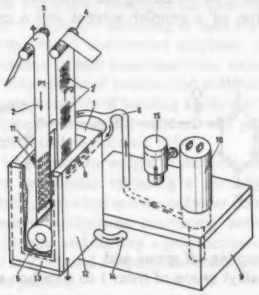
Hans-Dieter Hinz, Tornesch; Ulf Rothgordt, Norderstedt, and Franz Schinke, Hamburg, all of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 15, 1977, Ser. No. 824,502

Claims priority, application Fed. Rep. of Germany, Sep. 11, 1976, 2641026

Int. Cl.[2] G03G *103/10*

U.S. Cl. 430—117 **3 Claims**



1. A method of electrostatic development of electrostatic charge images impressed on a surface of a smooth, tape-like record carrier in a liquid, by guiding the carrier through a developer tank through which developer liquid is continuously flowing, comprising:

spraying a first flow of developer liquid against the surface of the record carrier on which the charge image is formed so as to form a first uniform flow zone,

spraying a second flow of developer liquid against the surface of the record carrier on which the charge image is formed so as to form a second uniform flow zone, the liquid in said first and second flows flowing toward each other on said surface, and the liquid in said first and second flow zones flowing on said surface to a common turbulent flow zone at the meeting of the two uniform flow zones.

4,233,386

METHOD OF REMOVING RESIDUAL TONER FROM SURFACE OF PHOTOCONDUCTIVE MEMBER FOR USE IN ELECTROSTATIC COPYING APPARATUS OF THE TRANSFER TYPE

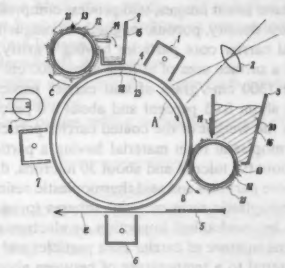
Tatsuo Aizawa; Nobuhiko Kozuka, both of Osaka, and Yuji Hasegawa, Hyogo, all of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Sep. 14, 1978, Ser. No. 942,379

Claims priority, application Japan, Sep. 19, 1977, 52-112830

Int. Cl.[3] G03G *13/14, 15/00, 15/06*

U.S. Cl. 430—125 **4 Claims**



1. In an electrostatic copying process of the type including providing a photoconductive member having a photoconductive surface over a conductive base, sensitizing said photoconductive surface by charging said photoconductive surface to a given polarity, exposing the thus charged surface to an optical image and thereby forming an electrostatic latent image on said photoconductive surface, developing said electrostatic latent image by means of a singlecomponent magnetic toner including toner particles which are polarizable in an electric field, such that said toner particles are polarized in accordance with charges forming said electrostatic latent image and are deposited on said surface by an electrostatic attraction force between said toner particles and said surface to thereby form a toner image on said surface, transferring said toner image to a copy paper, and thereafter cleaning from said surface any residual toner particles remaining after said transfer, the improvement wherein said cleaning comprises:

subjecting said surface and said residual toner particles to a charge of the same polarity as said given polarity, thereby increasing the charge of said given polarity on outer portions of said residual toner particles and on portions of said surface not covered by said residual toner particles, and thereby inducing in said conductive base a charge of the opposite polarity from said given polarity;

uniformly exposing said surface, simultaneously with or after said step of subjecting, and thereby neutralizing said charge of said given polarity on said portions of said surface not covered by said residual toner particles with said charge of opposite polarity in said conductive base;

whereby there is achieved an electrical neutralization over the entire area of said surface and said residual toner particles and a reduction of said electrostatic attraction force between said residual toner particles and said surface; and

removing said residual toner particles from said surface by brushing said surface with a magnetic brush formed of a single-component magnetic toner including toner particles which are polarizable in an electric field, and magnetically attracting to said magnetic brush said residual toner particles from said surface against the reduced electrostatic attraction force therebetween, while preventing

polarization of said toner particles forming said magnetic brush due to said electrical neutralization.

4,233,387

ELECTROPHOTOGRAPHIC CARRIER POWDER COATED BY RESIN DRY-MIXING PROCESS

Joseph Mammino, Penfield; Timothy F. Johnson; David W. Walters, both of Williamson, and Steven R. Perez, Pittsford, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 5, 1979, Ser. No. 17,229
Int. Cl.[3] G03G 9/10; B05D 7/00
U.S. Cl. 430—137 **14 Claims**

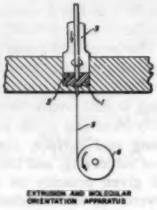
1. The process of preparing coated carrier particles useful in electrostatographic developer mixtures for the development of electrostatic latent images, said process comprising the steps of mixing low density, porous, magnetic or magnetically-attractable metal carrier core particles having a gritty, oxidized surface and a surface area of at least about 200 cm^2/gram and up to about 1300 cm^2/gram of said carrier particles with from between about 0.05 percent and about 3.0 percent by weight based on the weight of the coated carrier particles, of particulate thermoplastic resin material having a particle size of between about 0.1 micron and about 30 microns, dry-mixing said carrier core particles and said thermoplastic resin material until said thermoplastic resin material adheres to said carrier core particles by mechanical impaction or electrostatic attraction, heating the mixture of carrier core particles and thermoplastic resin material to a temperature of between about 320° F. and about 650° F. for between about 120 minutes and about 20 minutes so that said thermoplastic resin material melts and fuses to said carrier core particles, cooling the coated carrier particles, and classifying said coated carrier particles to the desired particle size.

4,233,388

METHOD FOR MAKING TONER PARTICLES

Richard F. Bergen, Ontario, and Charles L. Beatty, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed May 18, 1979, Ser. No. 40,333
Int. Cl.[3] G03G 9/16
U.S. Cl. 430—137 **10 Claims**



EXTRUSION AND MOLECULAR ORIENTATION APPARATUS

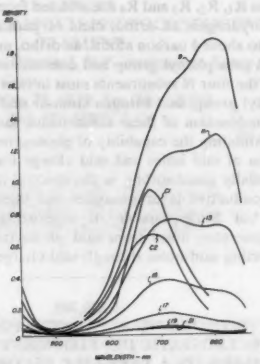
6. A process for preparing electrostatographic toner particles having improved mechanical properties and controlled particle size and particle size distribution comprising forming a blend comprising a molten mass of low molecular weight polymers and a colorant selected from the group consisting of pigments and dyes, extruding said blend to provide molecular orientation to said polymers, drawing said blend during cooling and solidification of said polymers to form a film or fiber thereof, and passing said film or fiber through embossed rollers to cut said film or fiber into discrete particles having a particle size of between about 1 micron and about 30 microns.

4,233,389

FLUORINATED 1-HYDROXY-2-NAPHTHAMIDE COUPLER COMPOSITIONS AND PHOTOGRAPHIC ELEMENTS SUITED TO FORMING INTEGRAL SOUND TRACKS

Jose M. Fernandez, Rochester; Robert G. Cameron, Spencerport, and Edward J. Walsh, Pittsford, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

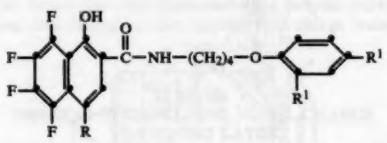
Continuation-in-part of Ser. No. 928,756, Jul. 27, 1978, abandoned. This application Jul. 23, 1979, Ser. No. 59,818
Int. Cl.[3] G03C 7/24, 1/40
U.S. Cl. 430—140 **17 Claims**



1. In a silver halide photographic element comprising a support and, coated thereon, at least one layer unit which comprises a photographic silver halide emulsion layer and coupler solvent particles dispersed in a photographically useful amount in said emulsion layer or in an adjacent hydrophilic colloid layer,

the improvement wherein

said coupler solvent particles are comprised of a combination, capable of permitting the formation of a microcrystalline dye, of a coupler solvent and a coupler of the formula



wherein

R is a coupling-off group and

R^1 is an alkyl group of from 1 to 6 carbon atoms.

4,233,390

LITHOGRAPHIC PRINTING PLATE HAVING DUAL PHOTOSENSITIVE LAYERING

Paul Jargiello, Orange, N.J., assignor to Polychrome Corporation, Yonkers, N.Y.

Continuation-in-part of Ser. No. 839,967, Oct. 6, 1977, abandoned. This application Jul. 20, 1979, Ser. No. 58,976
Int. Cl.[2] G03C 1/52, 1/76, 1/68
U.S. Cl. 430—156 **7 Claims**

1. A lithographic printing plate capable of development with an aqueous alkali developer which comprises a sheet substrate having coated thereon a light-sensitive, lithograhically suitable, water-soluble diazo composition, said diazo composition having coated thereon a lithographically suitable photopolymerizable composition, which photopolymerizable composition

comprises the admixture of, in percent by weight of the photopolymerizable composition:

(a) an acrylonitrile butadiene styrene resin in an amount of from 2% to 25%; and

(b) one or more resins selected from the group consisting of solid acrylic, polyurethane and polyamide resins in an amount of from 4% to 50%; and

(c) cellulose acetate phthalate in an amount of from 4% to 50%; and

(d) one or more ethylenically unsaturated monomeric or oligomeric compounds having on the average, more than one double bond, and being capable of forming a high polymer by free radical addition photopolymerization, in an amount of from 20% to 60%; and

(e) a photoinitiator capable of generating free radicals in an amount of from 0.5% to 45%; and

(f) p-phenol sulfonic acid sodium salt in an amount of from 0.4% to 5%.

4,233,391

WATER DEVELOPABLE PHOTOPOLYMERIZABLE COMPOSITIONS CONTAINING PHOSPHINE ACTIVATORS AND SAPONIFIED POLYVINYL ACETATE

Sakuo Okai, Carlsbad, and Koichi Kimoto, Oceanside, both of Calif., assignors to Napp Systems (USA) Inc., San Marcos, Calif.

Continuation-in-part of Ser. No. 941,519, Sep. 9, 1978, abandoned. This application Aug. 27, 1979, Ser. No. 70,190

Int. Cl.[3] G03C *1/68*

U.S. Cl. 430—281 17 Claims

1. A photopolymerizable composition for water developable printing plates which can be exposed and developed without pre-exposure conditioning comprising:

a. about 0.1 to 3.0 parts by weight of the total composition of a monomer component including at least one water-soluble, monofunctional unsaturated ethylenic monomer, or the combination of said monofunctional monomer and at least one polyfunctional unsaturated ethylenic monomer, said monomers capable of forming a polymer by photoinitiated polymerization in the presence of a polymerization initiator activatable by actinic light:

b. about 0.1 to 3.0 parts by weight of the total composition of a polymer component including a partially saponified, water-soluble, polyvinyl acetate polymer compatible with said monomer component containing both acetyl and hydroxy groups, and having a polymerization degree of about 300 to 2,000 and a saponification degree of about 65 to 99 mole percent;

c. about 0.001 to 0.3 parts by weight of the total composition of a photopolymerization initiator compatible with said monomer component and said polyvinyl acetate polymer, and activatable by actinic light; and,

d. about 0.001 to 0.3 parts by weight of the total composition of an activator including a phosphine derivative described by the formula:

wherein any of X, Y and Z are hydrogen, halogen, alkyl, alkoxy, aryl, vinyl or allyl and at least one of X, Y and Z is aryl.

4,233,392

LIGHT-SENSITIVE MATERIAL FOR TANNING DEVELOPMENT COMPRISING PRETREATED CARBON

Horst Friedel, Neu Isenburg, Fed. Rep. of Germany, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 20, 1979, Ser. No. 31,977

Claims priority, application Fed. Rep. of Germany, Jul. 25, 1978, 2832530

Int. Cl.[2] G03F *7/02;* G03C *1/40*

U.S. Cl. 430—264 12 Claims

1. In a light-sensitive material for tanning development consisting of a support, an unhardened or only slightly hardened gelatin-containing silver halide emulsion layer and, if desired, an auxiliary layer, wherein at least one layer contains a carbon black participating in forming an image, the improvement comprising employing a carbon black pretreated with at least two water-miscible compounds which have a higher affinity for carbon black than gelatin, said compounds being selected from at least two of the following compound classes,

(a) Poly-N-vinyl lactams

(b) Polyalkylene oxide derivatives

(c) Low volatility water-miscible compounds containing at least two OH groups

(d) Polyalkylene oxides with a molecular weight of at least 400.

4,233,393

SILVER HALIDEPHOTOSENSITIVE MATERIAL

Keisuke Shiba, and Nobuyuki Kita, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Division of Ser. No. 807,612, Jun. 17, 1977, abandoned. This application Jul. 24, 1978, Ser. No. 927,228

Claims priority, application Japan, Jun. 18, 1976, 51-71845

Int. Cl.[2] G03F *7/02*

U.S. Cl. 430—265 12 Claims

1. A process of preparing a printing plate which comprises the steps of

(1) imagewise exposing a silver halide photosensitive material comprising a support having a hydrophilic surface, a silver halide photosensitive emulsion layer on said surface and synthetic resin layer on said emulsion layer, with the synthetic resin being substantially insoluble in water, with the synthetic resin layer being permeable to water and an alkaline solution and with the synthetic resin being at least one of a polymer and oligomer, and being selected from the group consisting of polyesters, polyamides, phenolaldehyde resins, polyurethanes, epoxy resins, silicone resins, polyamines, polystyrenes, polyacrylates, polyvinyl acetate, hydroxypropyl methyl cellulose and hexahydrophthalate.

(2) tanning developing said exposed photosensitive material, and then

(3) washing-off said tanning developed photosensitive material with water to remove non-tanned area of said emulsion layer and synthetic resin layer on said area to reveal the hydrophilic surface of the support, thereby to form a printing plate.

4,233,394

METHOD OF PATTERNING A SUBSTRATE

John N. Helbert, Eatontown, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 22, 1979, Ser. No. 51,263

Int. Cl.[3] B05D *3/06*

U.S. Cl. 430—270 4 Claims

1. Method of patterning a substrate, said method including the steps of:

(A) dissolving polymethacrylonitrile in a spinning solvent that will dissolve the polymer and form a viscous solution,

(B) applying the solution to the surface of the substrate to

form a smooth, uniform resist film of at least 3,000 angstroms in thickess,

(C) heating the resist film,

(D) exposing the region of the resist film to be patterned to ionizing radiation until the dissolution rate of the irradiated region of the resist film is greater than 5 times the dissolution rate of the unirradiated region of the resist film, and

(E) developing the exposed regions of the resist to the substrate in a developer selected from the group consisting of a 3 to 4 mixture of acetonitrile and toluene.

4,233,395

PHOTOPOLYMERIZABLE TRANSFER MATERIAL

Kurt Klüpfel, Wiesbaden-Sonnenberg, and Heide Sprengel, Wiesbaden-Biebrich, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Germany, Fed. Rep. of Germany

Continuation of Ser. No. 802,410, Jun. 1, 1977, abandoned, which is a continuation of Ser. No. 621,578, Oct. 10, 1975, abandoned. This application Jan. 17, 1979, Ser. No. 4,124

Claims priority, application Fed. Rep. of Germany, Oct. 14, 1974, 2448850

Int. Cl.[2] G03C 1/63, 1/78

U.S. Cl. 430—271 13 Claims

1. In a photopolymerizable transfer material comprising a flexible base, and a thermoplastic photopolymerizable copying layer, said layer comprising

(a) a thermoplastic polymeric binder,

(b) a photopolymerizable acrylic or methacrylic ester which boils at a temperature of at least 100° C. and which contains at least one terminal, ethylenically unsaturated group, and

(c) a photoinitiator activatable by actinic radiation, weight, based on the weight of the non-volatile components of the layer, of an adhesion-imparting substance effective to improve adhesion to copper or copper-alloys evenly distributed in the photopolymerizable copying layer and/or havng said adhesion-imparting substance in a separate, homogeneous, coherent layer on top of said copying layer on the opposite side of said flexible base, said adhesion-imparting substance having the formula

$$HS-CH_2-\underset{\displaystyle R_1}{\underset{|}{(CH)_n}}-R_2$$

in which

n is 0 or an integer from 1 to 3,

R_1 is H or OH,

R_2 is H or $COOR_3$, and R_3 is an alkyl group having from 1 to 25 carbon atoms.

4,233,396

SHAPED POLYMERIC ARTICLES MADE BY TWO-STAGE PHOTOPOLYMERIZATION

Colin Armstrong, Woodley, and Derek J. Walbridge, Beaconsfield, both of England, assignors to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 348,534, Apr. 6, 1973, abandoned. This application Jan. 26, 1979, Ser. No. 6,755

Claims priority, application United Kingdom, Apr. 10, 1972, 16399/72

Int. Cl.[2] G03C 5/00; H05B 1/00

U.S. Cl. 430—320 7 Claims

1. A process of producing a rigid article which comprises the steps

(a) partially polymcrizing by irradiation with visible or ultraviolet light a composition of fibrous reinforcement and a photopolymerizable liquid which comprises an ethylenically unsaturated polyester and an ethylenically unsaturated monomer in the presence of at least one photosensitive catalyst capable of initiating polymerization of the liquid on irradiation so as to form a flexible sheet, film, rod or tube said sheet, film, rod or tube being further polymerizable on exposure to visible or ultraviolet light but not polymerizable further if stored in the dark,

(b) halting the polymerization by temporarily protecting the sheet, film, rod or tube from further irradiation whereby the sheet, film, rod or tube may be stored for a long period without deterioration of properties, and

(c) subsequently shaping and further irradiating the sheet, film, rod or tube to polymerize it to form a substantially rigid article of more complex shape.

4,233,397

PROCESS FOR THE PREPARATION OF COUPLER DISPERSIONS

Sugihiko Tada, and Yuzo Inukai, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Continuation-in-part of Ser. No. 858,868, Dec. 8, 1977, abandoned. This application May 29, 1979, Ser. No. 43,584

Claims priority, application Japan, Dec. 8, 1976, 51-147506; Aug. 30, 1977, 52-104010

Int. Cl.[2] G03C 1/40

U.S. Cl. 430—449 22 Claims

1. A process for removing an auxiliary solvent from a hydrophilic colloid coupler dispersion containing an auxiliary solvent having a boiling point in the range of 60°–100° C. which comprises contacting the hydrophilic colloid coupler dispersion containing the auxiliary solvent with an auxiliary solvent-carrying fluid medium through a hydrophobic macroporous film made of polytetrafluroethylene or polypropylene permeable to the auxiliary solvent and impermeable to the hydrophilic colloid, whereby the auxiliary solvent diffuses from the hydrophilic colloid coupler dispersion through the hydrophobic macroporous film into the auxiliary solvent-carrying fluid medium.

4,233,398

PROCESS FOR THE HARDENING OF PHOTOGRAPHIC LAYERS UTILIZING FAST ACTING HARDENER AND POLYSACCHARIDE

Fritz Nittel; Karl Czernik; Wolfgang Sauerteig; Wolfgang Himmelmann, all of Leverkusen, and Peter Bergthaller, Cologne, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 565,416, Apr. 7, 1975, abandoned. This application Feb. 24, 1978, Ser. No. 881,027

Claims priority, application Fed. Rep. of Germany, Apr. 11, 1974, 2417779

Int. Cl.[2] G03C 1/76, 1/30, 1/02

U.S. Cl. 430—495 2 Claims

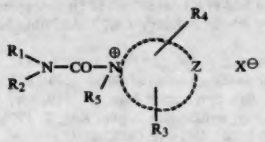
1. The process of hardening a photographic material comprising at least one layer comprised of a light-sensitive silver halide emulsion and at least one layer containing a binder comprised of gelatin

which comprises the step of

applying to at least one layer containing gelatin a coating of a composition consisting essentially of from 5 to 500 g per

1000 ml of water of a quick acting hardener which acts by activating carboxyl groups present in the gelatin selected from the group consisting of

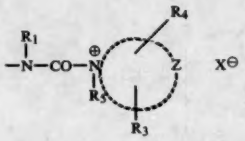
(a) a compound of the following general formula



wherein

R_1=an unsubstituted or substituted alkyl, aryl or aralkyl group,

R_2=either (1) an unsubstituted or substituted alkyl, aryl or aralkyl group and has the same meaning as R_1 or (2) an alkyl, aryl, aralkyl or alkyl-aryl-alkyl group which is substituted with another carbamoyl ammonium group of the formula



or

R_1 and R_2 together form the atoms required for completing a substituted or unsubstituted heterocyclic ring;

R_3=hydrogen, alkyl or the group A wherein A denotes a vinyl group of a polymerisable vinyl compound or of a copolymer with other copolymerisable monomers and α represents a number such that the molecular weight of the compound is greater than 1000,

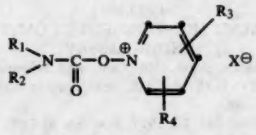
R_4=hydrogen, or alkyl or, where Z denotes the atomic group required for completing a pyridinium ring and R_3 is absent, R_4 denotes a formylamino, acrylamino ureido group substituted or unsubstituted on the nitrogen atom, an alkyl group substituted with acylamino or ureido groups which in turn may be substituted, a substituted or unsubstituted amido group, or alkyl which is substituted with an optionally substituted amido group, a straight chain or branched chain alkyl substituted with hydroxyl, alkyl, formyloxy, acyloxy or optionally substituted carbamoyloxy, a straight chain or branched chain alkyl substituted with amino, alkylamino, formylamino, acylamino or a ureido group;

R_5=alkyl, aryl or aralkyl but R_5 is absent if the nitrogen atom to which R_5 is attached carries a double bond in the heterocyclic aromatic ring formed by Z,

Z=the group of atoms required for completing a 5-membered or 6-membered substituted or unsubstituted heterocyclic aromatic ring, including a condensed ring system, which group may include one or more additional heteroatoms, and

X=an anion,

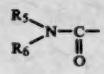
(b) a carbamoyloxy pyridinium of the general formula



wherein

R_1=alkyl or aryl,

R_2=alkyl or the group

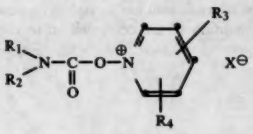


R_5 denotes hydrogen or alkyl and

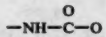
R_6 denotes alkyl,

R_1 and R_2 together represent the atoms required for completing a heterocyclic ring system such as a pyrrolidine-, morpholine-, piperidine-, perhydrozepine, 1,2,3,4-tetrahydroquinoline or imidazolidine-2-one ring or

R_1 and R_2 together represent the atoms required for completing a piperazine ring in which the second nitrogen atom establishes the connection to a second, similar carbamoyloxy pyridinium molecular grouping corresponding to the general formula,



R_3=hydrogen, halogen, alkyl, hydroxyalkyl, cyanogen, CONH or

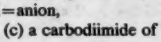


alkyl

R_4=hydrogen or alkyl and

X=anion,

(c) a carbodiimide of the general formula

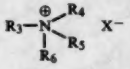


wherein

R_1 and R_2=identical or different alkyl, alkoxyalkyl or optionally substituted aryl groups or a 5-membered optionally substituted heterocyclic ring or

R_1=alkyl containing 1-5 C-atoms and

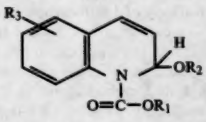
R_2=the group



wherein R_3=alkyl containing 1-5 C-atoms, R_4 and R_5=alkyl containing 1-3 C-atoms or R_4 and R_5 together form a 6-membered heterocyclic ring containing one or two hetero atoms, R_6=H or a lower alkyl and X=an anion,

and

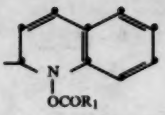
(d) a dihydroquinoline of the general formula



wherein

R_1=unsubstituted or substituted alkyl,

R_2=unsubstituted or substituted alkyl or aralkyl or, when R_3=H, R_2 denotes the group



R_3=hydrogen, halogen, alkyl, alkoxy

and 1 to 20 g of a polysaccharide which being free of carboxyl groups does not react with said quick-acting hardener and which is a linear polymer in which either

(1) at least one third of the monosaccharide units have a 1-2-bond and the remaining monosaccharide units have a 1-4-bond or

(2) substantially all the monosaccharide units have a 1-4 bond and at least 50% of the hydroxyl group of the monosaccharide units are acetylated or replaced by an OSO_3Me group, wherein Me denotes an alkali metal whereby the carboxyl activity of said hardener has an onset subsequent to the application of the composition to the gelatin containing layer.

4,233,399

PHOTOGRAPHIC ELEMENTS CONTAINING AMINO-SUBSTITUTED HYDROXY-PYRIDONES

Rainer Kitzing, Ingatestone; John G. V. Scott, Chelmsford; Terence C. Webb, Witham, and Graham Evans, Galleywood, all of England, assignors to Ciba-Geigy Aktiengesellschaft, Basel, Switzerland

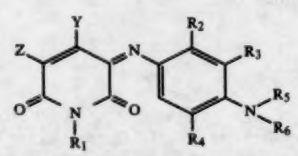
Division of Ser. No. 879,425, Feb. 21, 1978, Pat. No. 4,182,886. This application May 8, 1979, Ser. No. 37,071

Claims priority, application United Kingdom, Mar. 3, 1977, 8924/77

Int. Cl.[2] G03C *1/84*

U.S. Cl. 430—510 **11 Claims**

1. Light-sensitive photographic material which comprises in at least one layer thereof a dyestuff of the general formula



wherein R_1 is hydrogen, alkyl of 1 to 6 carbon atoms, hydroxyalkyl of 1 to 6 carbon atoms, alkoxyalkyl of 1 to 6 carbon atoms each in the alkyl and the alkoxy radical, phenyl, benzyl, β-phenylethyl or cyclohexyl, R_2 is hydrogen, chloro, alkyl, hydroxyalkyl or alkoxy each of 1 to 6 carbon atoms, R_3 is hydrogen, alkyl or alkoxy of 1 to 6 carbon atoms, R_4 is hydrogen or alkyl of 1 to 6 carbon atoms, R_5 and R_6 are hydrogen, alkyl or hydroxyalkyl of 1 to 6 carbon atoms, alkoxyalkyl of 1 to 6 carbon atoms each in the alkyl and the alkoxy radical, carboxyalkyl with 1 to 3 carbon atoms in the alkyl radical, β-methylsulphonamidoethyl or sulpho-n-butyl, R_5 and R_6 and the nitrogen atom to which they are attached are piperidine, morpholine, piperazine or pyrrolidine, Y is hydrogen, alkyl of 1 to 6 carbon atoms, hydroxy, $—COOR_{11}$ or $—CONR_{11}R_{12}$ and Z is —CN, $—COOR_{11}$ or $—CONR_{11}R_{12}$, wherein R_{11} and R_{12} are hydrogen or alkyl of 1 to 3 carbon atoms.

4,233,400

LIGHT-SENSITIVE SILVER HALIDE PHOTOGRAPHIC MATERIAL CONTAINING TETRAZOLIUM COMPOUNDS

Mitsuto Fujiwhara; Syunji Matsuo; Toyoaki Masukawa; Yutaka Kaneko, and Mikio Kawasaki, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Nihonbashi-muromachi, Japan

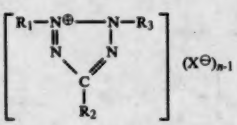
Continuation of Ser. No. 818,507, Jul. 25, 1977, abandoned, which is a continuation-in-part of Ser. No. 710,385, Aug. 2, 1976, abandoned. This application Mar. 2, 1979, Ser. No. 16,988

Claims priority, application Japan, Aug. 2, 1975, 50-94295

Int. Cl.[3] G03C *1/02*

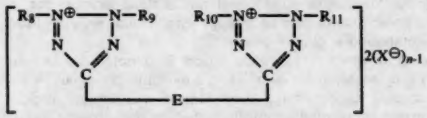
U.S. Cl. 430—523 **10 Claims**

1. A light-sensitive silver halide photographic material which consists essentially of a support, at least one hydrophilic colloidal layer coated thereon containing silver halide grains having an average grain size of from 0.05 to 1.5 μand at least 75% of which grains being within a range of from 0.6 to 1.4 times said average grain size, and a tetrazolium compound selected from the group consisting of a compound of formulae [I], [II] or [III]:



[I]

[II]



[III]

wherein R_1, R_3, R_4, R_5, R_8, R_9, R_{10} and R_{11} each represent an aryl group or a heterocyclic group; R_2, R_6 and R_7 each represents an aryl group, a heterocyclic group, an alkyl group, hydroxyl, carboxyl or the salt thereof, an amino group, mercapto, nitro or hydrogen; D represents a divalent aromatic group; E represents an alkylene group, an arylene group or an aralkylene group; X is an anion; said heterocyclic group being selected from the group consisting of a thiadiazolyl group, a benzothiadiazolyl group, an oxazolyl group, a pyrimidinyl group, a pyridyl group and a 2,5-dimethylthiazolyl group; and n is 1 or 2, provided that the compound forms an intramolecular salt when n is 1.

10. A light-sensitive silver halide photographic material according to claim 1 wherein the light-sensitive silver halide photographic material further comprises an outermost gelatin protective layer having a thickness of from 0.1 to 10 μ on the hydrophilic colloidal layer.

4,233,401

ANTIENZYME HOMOGENEOUS COMPETITIVE BINDING ASSAY

Robert A. Yoshida, Mountain View, and Edward T. Maggio, Redwood City, both of Calif., assignors to Syva Company, Palo Alto, Calif.

Filed Jul. 14, 1977, Ser. No. 815,487

Int. Cl.[2] G01N *31/14, 33/16*

U.S. Cl. 435—7 **23 Claims**

1. A method for determining the presence in a sample of an

analyte which is a member of an immunological pair consisting of ligand and ligand receptor which comprises:

combining in an aqueous medium:

(A) said sample;

(B) enzyme-bound-ligand which retains a substantial proportion of its activity when bound to receptor;

(C) ligand receptor, when ligand is the analyte, wherein said receptor is capable of specifically binding to said ligand and said enzyme-bound-ligand; and

(D) enzyme inhibitor, of at least about 2,000 molecular weight wherein said inhibitor is impeded from inhibiting said enzyme-bound-ligand, when receptor is bound to enzyme-bound-ligand; and

determining the enzymatic activity in said medium as compared to the enzymatic activity in a medium having a known amount of analyte.

4,233,402

REAGENTS AND METHOD EMPLOYING CHANNELING

Edward T. Maggio, Redwood City, Calif.; Richard L. Wife, Sittingbourne, England, and Edwin F. Ullman, Atherton, Calif., assignors to Syva Company, Palo Alto, Calif.

Filed Apr. 5, 1978, Ser. No. 893,650

Int. Cl.[2] C12Q *1/66*

U.S. Cl. 435—7 **44 Claims**

1. A method for determining the presence of an analyte in a sample suspected of containing said analyte, said analyte being a member of a specific binding pair consisting of ligand and antiligand, wherein the amount of a detectable signal is a function of the amount of analyte in an assay medium, said detectable signal being produced by having three primary reagents:

(A) reactant label conjugate consisting of a reactive organic compound conjugated to a member of said specific binding pair which interacts with a signal mediator precursor to produce a signal mediator;

(B) signal producing label conjugate, which consists of a compound which is a component of a detectable signal producing system conjugated to a member of said specific binding pair, wherein the amount of signal produced is affected by the localized concentration of said signal mediator, with the proviso that said signal producing label and said reactant label may be bonded to the same molecular member of said specific binding pair to produce a single reagent which is a reactant label-signal producing label conjugate; and

(C) signal mediator precursor, which is an unconjugated compound which interacts with said reactant label to produce said signal mediator which is said precursor in an electronically excited state or a reaction product of said signal mediator precursor and said reactant label, with the proviso that when said reactant label and said signal producing label are both the same enzyme, said signal mediator precursor has a plurality of substituents having bonds cleavable by said enzyme and said signal mediator is at an intermediate level of substitution by said substituents.

wherein the average spatial proximity in said assay medium of said reactant label and said signal producing label is affected by the concentration of analyte in said medium and the bringing together of said reactant label conjugates and said signal producing label conjugates or a plurality of reactant label-signal producing label conjugates by means of the binding together of said ligand or ligand analog and antiligand brings said reactant labels and said signal producing labels into a microenvironment, so as to create a localized concentration of signal mediator differing from the concentration of signal mediator in the mass of said assay medium;

said method comprising:

combining in an aqueous assay medium:

(A) said sample;

(B) said reactant label conjugate;

(C) said signal producing label conjugate; with the proviso that both said reactant label conjugate and signal producing label conjugate may be replaced with reactant label-signal producing label conjugate;

(D) said signal mediator precursor with the proviso that when said reactant label and said signal producing label are both the same enzyme, said signal mediator precursor is employed having at least two substituents having covalent bonds cleaved by said enzyme;

(E) any auxiliary reagents necessary for the reaction of said reactant label and said signal producing label; and

(F) poly(ligand analog), when said ligand is monoepitopic and monolabel-monoligand is employed as one of said conjugates; and

determining the resulting detectable signal as compared to the detectable signal from an assay medium having a known amount of analyte.

4,233,403

AMYLASE ASSAY

Robert C. Menson, Newport Beach, Calif.; Venkatachalam Narayanswamy, and Richard C. Burns, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

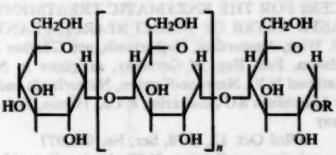
Continuation-in-part of Ser. No. 704,976, Jul. 13, 1976, abandoned. This application Feb. 27, 1978, Ser. No. 881,669

Int. Cl.[3] C12Q *1/40*

U.S. Cl. 435—22 **15 Claims**

1. A method for the rapid determination of the amylase content of a sample comprising the amylase content of a sample comprising the steps of:

(a) adding to a solution containing a measured amount of the sample a defined polysaccharide substrate having the following formula:



where n is 2, 3, or 4, and R is a substituted aromatic radical which, as a detached aglycone, exhibits a different spectral absorbance than the substrate;

(b) adding a maltase to the solution; and

(c) monitoring the spectral absorbance of the solution.

4,233,404

METHOD FOR TESTING FOR THE PRESENCE OF PATHOGENS

Robert E. Baier, Buffalo, N.Y., assignor to Calspan Corporation, Buffalo, N.Y.

Filed Nov. 9, 1979, Ser. No. 92,796

Int. Cl.[3] C12Q *1/24*

U.S. Cl. 435—30 **3 Claims**

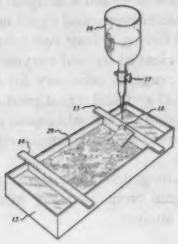
1. A method for detecting and concentrating airborne and waterborne pathogens including the steps of:

providing an air/water interface having a relatively large surface area;

contacting the air/water interface with the fluid to be tested so as to minimize agitation of the air/water interface;

after a sufficient time, reducing the area of the air/water

interface so as to concentrate pathogens collected at the air/water interface into a concentrate; and



removing the concentrate from the air/water interface for analysis.

4,233,405

PROCESS FOR SPRAY DRYING ENZYMES

Clifford E. Neubeck, Hatboro, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Oct. 10, 1979, Ser. No. 83,449
Int. Cl.[3] C12N *9/98*
U.S. Cl. 435—187 10 Claims

1. A process for the preparation of a spray-dried enzyme composition which comprises: concentrating a liquid enzyme solution by ultrafiltration; adding to said concentrate water-insoluble salts, optionally in presence of water, insoluble suspenders and thickeners, intimately mixing the concentrate composition, and spray-drying the concentrate composition at air inlet temperatures from about 150° C. to about 180° C. and air outlet temperatures from about 65° C. to about 90° C.

4,233,406

PROCESS FOR THE ENZYMATIC TREATMENT OF WASTE WATER OF WHEAT STARCH PLANTS

Andras J. Wieg, Amsterdam, Netherlands, and Günther Jäckering, Hamm, Fed. Rep. of Germany, assignors to Naarden International N.V., Naarden-Bussum, Netherlands and Altenburger Maschinen KG Jaeckering & Co., Hamm, Fed. Rep. of Germany

Filed Oct. 13, 1978, Ser. No. 951,077
Claims priority, application Netherlands, Oct. 12, 1977, 7711211
Int. Cl.[2] C13L *1/00*
U.S. Cl. 435—275 13 Claims

1. A process for the purification of waste water of a plant for the production of wheat starch wherein said waste water is subjected, in any sequence, to treatment steps comprising:

(a) a heat treatment followed by the separation of the solid substance; and

(b) a treatment of said waste water with one or more of the enzymes α-amylase, cellulase, and hemicellulase and, optionally, with one or more of the enzymes glucoamylase, and α-glucanase.

4,233,407

APPARATUS FOR THE CONTINUOUS STERILE FERMENTATION

Dieter Seebeck, Wiesbaden; Jens A. Schildmann; Reinhard Weisrock, both of Nieder-Olm, and Julius Koch, Eltville, all of Fed. Rep. of Germany, assignors to Peter Eckes, Nieder-Olm, Fed. Rep. of Germany

Continuation of Ser. No. 738,404, Nov. 3, 1976, abandoned. This application Nov. 15, 1978, Ser. No. 960,893
Int. Cl.[2] C12B *1/00*; C12C *11/00*; C12G *1/00*
U.S. Cl. 435—311 2 Claims

1. Apparatus for continuously fermenting solutions under sterile conditions comprising a closed upright slender fermentation tower having a hollow interior, a lower end, and an enlarged upper end section, said lower end having connected thereto an inlet means for introducing unfermented feed solution into the lower end, a sterile gas inlet means fitted with a membrane filter and sintered candle means to bubble sterile gas into the lower end and a steam inlet means connected via a sampling means to sterilize the lower end and the sampling means by supplying steam thereto; said upper end section having connected thereto an outlet means for product discharge, a sterile gas inlet means fitted with a membrane filter to introduce sterile gas into the upper end section, a steam inlet means to sterilize the upper end section by supplying steam thereto, a gas exhaust outlet means fitted with a membrane filter and a pressure regulating means for maintaining excess pressure in the tower, and said tower having over its length, between the lower end and upper end section, a plurality of steam inlet means connected via a sampling means for supplying steam to sterilize the length of the tower between the lower end and upper end sections and to sterilize the sampling means.

4,233,408

POLYURETHANE FOAMS FROM POLYESTER PRECURSOR DERIVED FROM ADIPIC ACID PROCESS WASTE

Kenneth P. Satterly, Chadds Ford, Pa., and Frank E. Livingston, Cardiff, Del., assignors to Witco Chemical Corporation, New York, N.Y.

Filed May 7, 1979, Ser. No. 36,952
Int. Cl.[3] C08G *18/14*, *18/42*
U.S. Cl. 521—172 9 Claims

1. A process for making polyurethane comprising reacting an organic polyisocyanate with a polyester polyol prepared by:

a. oxidizing cyclohexane to form cyclohexanone, cyclohexanol and a non-volatile residue;

b. separating out the non-volatile residue;

c. reducing the water content of the residue to about less than 15% by weight;

d. reacting the recovered residue from (c) with an esterifying polyol to form a polyester polyol.

4,233,409

POLYMERIC BLEND

Charles W. Bulkley, East Longmeadow, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed Jul. 5, 1979, Ser. No. 55,202
Int. Cl.[3] C08F *41/12*
U.S. Cl. 525—71 12 Claims

1. A polymeric blend composition comprising:

A. a first ABS type polyblend prepared by polymerizing a solution of a first conjugated diene rubber dissolved in alkenyl aromatic and alkenyl nitrile monomers, having first grafted conjugated diene rubber particles with a particle size of about 0.7 to 10 microns, said first diene rubber particles having present about 1 to 5 parts of a monoalkenyl aromatic-alkenyl nitrile copolymer as grafted and occluded copolymer, said first polyblend having a rubber moiety present in an amount of about 1 to 15% by weight based on said first ABS polyblend,

B. a second ABS type polyblend prepared by polymerizing alkenyl aromatic and alkenyl nitrile monomers in the presence of a second conjugated diene rubber dispersed as rubber particles in an aqueous latex, having second grafted conjugated diene rubber particles with a particle size of about 0.01 to 0.50 microns, said second diene rubber particles being grafted with said copolymer as a superstrate in an amount of about 0.10 to 2.5 parts per part of diene rubber, said second polyblend having a rubber moiety present in an amount of about 2 to 50% by weight of said second ABS polyblend,

C. a grafted conjugated diene rubber terpolymer said diene rubber grafted with alkenyl aromatic and alkyl alkacrylate

monomers and a rubber moiety of about 10 to 70% by weight,

D. a block copolymer rubber of conjugated diene and alkenyl aromatic monomers, said diene monomer being present in at least 55% by weight of said copolymer, and

E. a matrix copolymer of said alkenyl aromatic and alkenyl nitrile monomers, said polymeric blend having by weight, 10 to 15 parts of (A), 35 to 50 parts of (B), 3 to 15 parts of (C), 5 to 20 parts of (D), and 15 to 25 parts of (E), and having improved ductility at low temperatures.

4,233,410

POLYMERIC LIGHT STABILIZERS FOR PLASTICS

Jean Rody, Basel, and Michael Rasberger, Riehen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

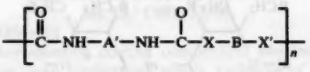
Division of Ser. No. 896,676, Apr. 14, 1978, abandoned, which is a continuation of Ser. No. 793,708, May 4, 1977, abandoned. This application Nov. 16, 1978, Ser. No. 962,564

Claims priority, application Switzerland, May 11, 1976, 5890/76

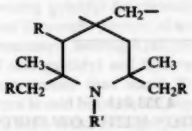
Int. Cl.³ C08L *75/02*

U.S. Cl. 525—123 **10 Claims**

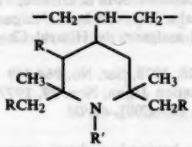
1. A polyurea of the general formula Ia,



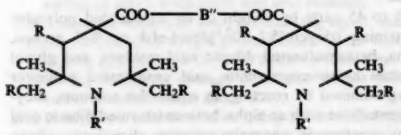
in which n represents a value from 2 to about 50, A′ is alkylene with 2–12 C atoms, arylene with 6–12 C atoms, 4,4′-dicyclohexylenemethane or a radical -phenylene-Z^4-phenylene- in which Z^4 is —CH_2—, >$C(CH_3)_2$, —O— or —SO_2—, X and X′ are NY and Y represents hydrogen, alkyl with 1–18 C atoms, cycloalkyl with 5–12 C atoms or aralkyl with 7–11 C atoms, and B is one of the radicals XXXI to XXXIX,



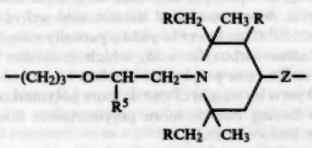
XXXI



XXXII

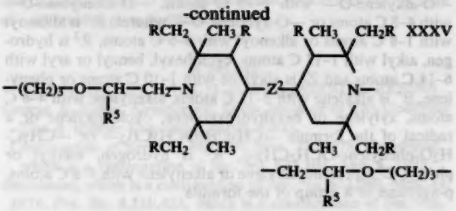


XXXIII

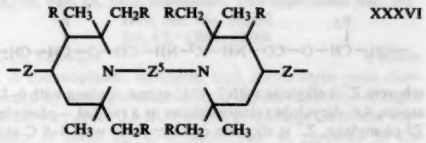


XXXIV

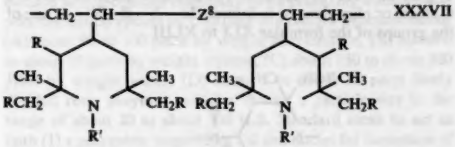
-continued



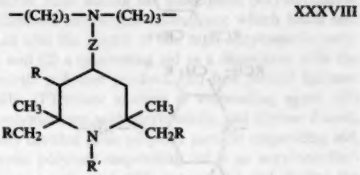
XXXV



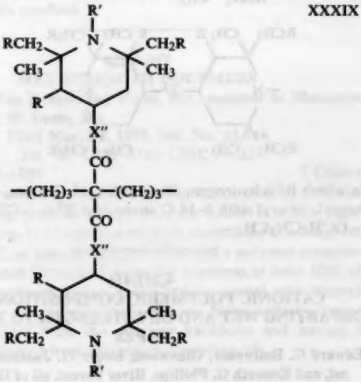
XXXVI



XXXVII

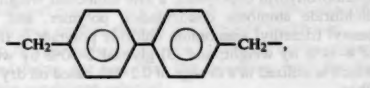


XXXVIII

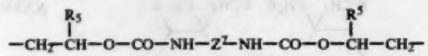


XXXIX

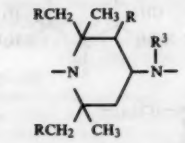
in which R represents hydrogen or alkyl with 1–5 C atoms, R′ is hydrogen, alkyl with 1–12 C atoms, allyl, benzyl, acetyl, acryloyl or crotonyl, Z is a direct bond or —CH_2CH_2— or —$OCH_2CH_2CH_2$—, Z^2 is one of the radicals —N(R″)—, —NR^3—CO—NR^3—, —NR^3—CO—CO—NR^3—, NR^3—CO—Z^3—CO—NR^3—, alkylene with 4–10 C atoms, p-xylylene,



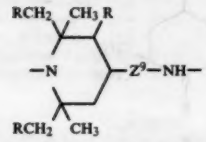
—O-alkylene-O— with 1–10 C atoms, —O-alkenylene-O— with 4–8 C atoms or —O-xylylene-O—, wherein R″ is alkanoyl with 1–8 C atoms or alkenoyl with 3–5 C atoms, R^3 is hydrogen, alkyl with 1–12 C atoms, cyclohexyl, benzyl or aryl with 6–14 C atoms and Z^3 is alkylene with 1–10 C atoms or phenylene, B″ is alkylene with 2–12 C atoms, alkenylene with 4–8 C atoms, xylylene or hexahydroxylylene, cyclohexylene or a radical of the formula $—CH_2CH_2OCH_2CH_2—$ or $—CH_2CH_2O$-phenylene-$OCH_2CH_2—$, R^5 is hydrogen, methyl or phenyl, Z^5 represents alkylene or alkenylene with 4–8 C atoms, p-xylylene or a group of the formula



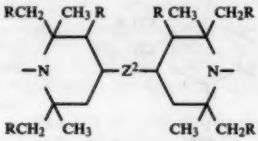
wherein Z^7 is alkylene with 2–12 C atoms, arylene with 6–12 C atoms, 4,4′-dicyclohexylenemethane or a radical —phenylene-Z^4-phenylene, Z^7 is alkylene or alkenylene with 4–8 C atoms or p-xylylene, X″ is oxygen or NH and Z^8 is alkylene with 1–6 C atoms or phenylene or in formula Ia —X—B—X′— is one of the groups of the formulae XLI to XLIII



XLI



XLII



XLIII

in which R^3 is hydrogen, alkyl with 1–12 C atoms, cyclohexyl, benzyl, or aryl with 6–14 C atoms and Z^9 is $—CH_2CH_2—$ or $—OCH_2CH_2CH_2—$.

4,233,411

CATIONIC POLYMERIC COMPOSITION FOR IMPARTING WET AND DRY STRENGTH TO PULP AND PAPER

Edward G. Ballweber, Glenwood; Roger H. Jansma, Park Forest, and Kenneth G. Phillips, River Forest, all of Ill., assignors to Nalco Chemical Co., Oak Brook, Ill.

Continuation-in-part of Ser. No. 957,952, Nov. 6, 1978. This application May 10, 1979, Ser. No. 37,797

Int. Cl.³ D21H *3/52*; C08L *33/26*

U.S. Cl. 525—155 **4 Claims**

1. A composition for imparting wet and dry strength to paper fiber which comprises a blend of (1) polyacrylamide 40–95% by weight; (2) a cationic regulator selected from the group consisting of a low molecular weight dimethyl amine epichlorohydrin copolymer, a low molecular weight ethylene dichloride ammonia condensation polymer, and polyvinyl benzyl trimethyl ammonium chloride polymer in the amount of 4–14% by weight; and (3) glyoxal 2–50% by weight, and which is utilized in a dosage of 0.2–5% based on dry weight of fiber.

4,233,412

POLYMERIC LIGHT STABILIZERS FOR PLASTICS

Jean Rody, Basel, and Michael Rasberger, Riehen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

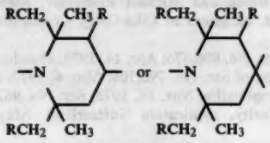
Continuation-in-part of Ser. No. 896,676, Apr. 14, 1978, abandoned, which is a continuation of Ser. No. 793,708, May 4, 1977, abandoned. This application Nov. 7, 1978, Ser. No. 958,446

Claims priority, application Switzerland, May 11, 1976, 5890/76

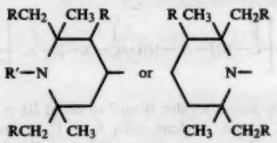
Int. Cl.³ C08G *63/02*

U.S. Cl. 525—167 **20 Claims**

1. A polyester, the recurrent molecular unit of which contains a polyalkylpiperidine radical of the formula



or is substituted by a polyalkylpiperidine side group of the formula



in which R denotes hydrogen or alkyl with 1–5 C atoms and R′ denotes hydrogen, alkyl with 1–12 C atoms, alkenyl with 3–8 C atoms, alkinyl with 3–6 C atoms, aralkyl with 7–12 C atoms, alkanoyl with 1–8 C atoms or alkenoyl with 3–5 C atoms, and copolymers thereof with polyalkylpiperidine-free components.

4,233,413

RESIN COMPOSITION WITH LOW SHRINKAGE

Noboru Monma; Iwao Maekawa, both of Hitachi; Tutomu Sarudate, Juomachi; Hidetaka Sato, and Isao Uchigasaki, both of Hitachi, all of Japan, assignors to Hitachi Chemical Company, Ltd., Japan

Filed Nov. 28, 1978, Ser. No. 964,169

Claims priority, application Japan, Nov. 29, 1977, 52-143064

Int. Cl.² C08L *67/06*

U.S. Cl. 525—168 **11 Claims**

1. A resin composition having low shrink properties which comprises

(A) 25 to 45 parts by weight of an unsaturated polyester containing tricyclo(5,2,1,$0^{2,6}$)dec-4-el-8 or 9-yl groups, alpha, betaunsaturated dibasic acid residues, and glycol residues as structural units, said unsaturated polyester being obtained by reacting, in equimolar amounts, dicyclopentadiene with an alpha, beta-unsaturated dibasic acid or by reacting, in equimolar amounts, dicyclopentadiene with an alpha, beta-unsaturated dibasic acid anhydride and water at 150° C. or lower to yield a partially esterified dicyclopentadienecarboxylic acid, which is further reacted with at least one polyhydric alcohol.

(B) to 40 to 60 parts by weight of one or more polymerizable monomoers having one or more polymerizable double bonds in the molecule, and

(C) 4.5 to 15 parts by weight of a polystyrene.

4,233,414

POLYHYDRIC PHENOL COESTER STABILIZERS

William E. Leistner, Atlantic Beach, N.Y.; Motonobu Minagawa, Kosigaya, Japan; Yutaka Nakahara, Iwatsuki, Japan, and Tohru Haruna, Okegawa, Japan, assignors to Argus Chemical Corporation, Brooklyn, N.Y.

Division of Ser. No. 740,110, Nov. 9, 1976, Pat. No. 4,174,297. This application May 29, 1979, Ser. No. 43,019

Int. Cl.[3] C08L *69/00, 67/02, 27/06*

U.S. Cl. 525—146 16 Claims

1. A stabilized synthetic resin composition comprising a synthetic resin and 0.01 to 5% by weight of the resin of a coester, having a molecular weight between 700 and about 10,000 measured by a vapor pressure method, of at least one polyhydric phenol, having 2 to 3 phenolic hydroxyl groups and 1 to 3 benzenoid rings, with carbonic acid and an aliphatic dicarboxylic acid having 4 to 10 carbon atoms and not more than one thioether sulfur atom, in which the molar proportions of carbonic acid to aliphatic dicarboxylic acid range from 19:1 to 1:19.

4,233,415

COATING COMPOSITION CATALYZED WITH PHOSPHONIC ACID DERIVATIVE-#2

Mohinder S. Chattha, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Nov. 13, 1979, Ser. No. 93,430

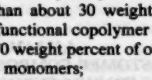
Int. Cl.[3] C08L *37/00*

U.S. Cl. 525—161 16 Claims

1. A thermosetting coating composition adapted for low temperature bake applications which, exclusive of pigments, solvents and other nonreactive components, consists essentially of:

(A) a bifunctional copolymer bearing hydroxy functionality and pendent epoxy functionality, having a number average molecular weight (Mn) of between about 1500 and about 10,000 and a glass transition temperature (Tg) of between about −25° C. and about 70° C., said copolymer consisting essentially of (i) between about 5 and about 25 weight percent of monoethylenically unsaturated monomers bearing gylcidyl functionality and between about 5 and about 25 weight percent of monoethylenically unsaturated monomers bearing hydroxy functionality, with the total of said gylcidyl and hydroxy functional monomers being not greater than about 30 weight percent of the monomers in said bifunctional copolymer and (ii) between about 90 and about 70 weight percent of other monoethylenically unsaturated monomers;

(B) A reactive catalyst comprising at least one phosphonic acid derivative having the formula:



wherein n=1 to 2 and R is selected from the group consisting of alkyl, cycloalkyl and aryl radicals;

(C) an amine-aldehyde resin crosslinking agent; and

(D) up to about 45 weight percent based on the total weight of (A), (B), (C), and (D) of a hydroxy functional additive having a number average molecular weight (Mn) of between about 150 and about 6000,

said phosphonic acid derivative being included in said composition in an amount sufficient to provide between about 0.8 and about 1.4 equivalents of acid functionality for each equivalent of pendent epoxy functionality on said bifunctional copolymer, and said amine-aldehyde resin crosslinking agent being included in said composition in an amount sufficient to provide at least about 0.4 equivalents of nitrogen cross-linking functionality for each equivalent of hydroxy functionality included in said composition as a group on an initial component thereof or generated in situ or as a result of esterification of said pendent epoxy functionality of said bifunctional copolymer during cure of said coating composition.

4,233,416

THERMOPLASTIC HIGH ACRYLONITRILE RESINS

George A. Kuhar, Greensburg, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 888,884, Mar. 21, 1978, abandoned, which is a continuation of Ser. No. 822,102, Aug. 5, 1977, abandoned, which is a continuation of Ser. No. 672,360, Mar. 31, 1976, Pat. No. 4,110,413, which is a continuation of Ser. No. 553,776, Feb. 27, 1975, abandoned. This application Apr. 16, 1979, Ser. No. 30,592

Int. Cl.[3] C08L *35/06*

U.S. Cl. 525—234 1 Claim

1. A thermoplastic, moldable, high acrylonitrile resin characterized by having a notched Izod impact resistance strength of about 1 to about 3.4 ft./lbs/inch and a heat distortion temperature of about 85° C. to about 105° C. prepared by the method which consists essentially of (I) preparing a suspension polymerization system by charging to a reactor as components, (A) about 90 to 100 parts by weight acrylonitrile, (B) about 0 to about 10 parts by weight styrene, (C) about 150 to about 300 parts by weight water, (D) about 2 to about 20 parts finely divided resin polymer particles having a particle size in the range of about 30 to about 300 U.S. Standard mesh to act as both (1) a polymeric suspending aid and nuclei for formation of high acrylonitrile resin during the subsequent polymerization in which a chemical interaction takes place which binds said suspending aid into the matrix of the high acrylonitrile polymer product and (2) a processing aid as a dispersion with the high acrylonitrile polymer product, (E) free radical initiator and, optionally, (F) minor amount of suspending agent, (II) free radical polymerizing said acrylonitrile, and styrene if used, onto said finely divided resin polymer particle suspending aid, where said resin polymer suspending aid is an acrylonitrile/-butadiene/styrene resin and (III) recovering and drying the resultant resin product.

4,233,417

WET STRENGTH POLYMERS

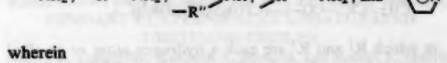
Donald N. Van Eenam, Des Peres, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Mar. 19, 1979, Ser. No. 21,414

Int. Cl.[3] C08F *8/18;* C08C *19/12*

U.S. Cl. 525—359 7 Claims

1. A process for the production of a water soluble, cationic, thermosetting polymeric wet strength additive which comprises reacting, in an aqueous medium maintained at a temperature of 20° C. or less, an epihalohydrin and a polymer comprising a backbone formed of repeating segments at least 10% of which comprise an amine group and/or partial salts thereof substantially all of said amine groups being tertiary amine groups pendant from the polymer backbone and having a structure selected from the group consisting of



wherein

R′ is selected from the group consisting of methyl and, where the nitrogen atom bears two R′ groups, these together with the nitrogen can form a heterocyclic radical;

R″ is a divalent radical and R‴ is a trivalent radical;

the unattached bond in each amine structure being attached directly to a carbon atom of the polymer backbone;

the ratio of epihalohydrin groups to tertiary amine groups reacted being not less than the transition ratio for the reaction conditions selected.

4,233,418

PROCESS FOR PREPARING RUBBER-MODIFIED STYRENE COPOLYMERS BY SUSPENSION COPOLYMERIZATION

Willy F. R. Lingier, Beersel; Emmanuel Lanza, Brussels, and William J. I. Bracke, Hamme, all of Belgium, assignors to Cosden Technology, Inc., Big Spring, Tex.

Filed May 31, 1978, Ser. No. 911,101
Int. Cl.[3] C08F 6/00; C08J 3/00
U.S. Cl. 525—243 48 Claims

1. A process for the production of rubber-modified vinyl aromatic copolymers having improved surface appearance and impact properties by suspension copolymerization, consisting essentially of the steps of:

(a) forming an aqueous suspension of an admixture of polymerizable materials comprising vinyl aromatic monomer and rubbery polymer;

(b) suspension polymerizing said admixture of polymerizable materials at a temperature between about 60° and 150° C. to a residual monomer content less than about 2% by weight to produce a rubber-modified vinyl aromatic copolymer comprising polymerized monomer dispersed in a gel-containing rubber phase;

(c) recovering beads of said copolymer containing crosslinked rubber and having a high macrogel content from said suspension; and

(d) causing phase inversion of said copolymer by melt extruding said copolymer under extrusion conditions having a shear force sufficient to induce phase inversion and produce a substantially gel-free rubber-modified vinyl aromatic copolymer comprising a continuous phase of polymerized vinyl aromatic monomer in which grafted rubbery polymer is homogeneously dispersed therethrough.

4,233,419

METHOD FOR PREVENTING PLASTICIZER BLEEDING ON POLYVINYL CHLORIDE SHAPED ARTICLES

Michihiko Asai, Fujisawa; Yoshio Suda, Hachioji; Kiyoshi Imada, Omiya; Susumu Ueno, and Hirokazu Nomura, both of Ibaragi, all of Japan, assignors to Agency of Industrial Science and Technology and Shin-Etsu Chemical Co., Ltd., both of, Japan

Filed Jun. 22, 1979, Ser. No. 51,150
Claims priority, application Japan, Jun. 26, 1978, 53-77295
Int. Cl.[2] C08L 27/22; C08K 5/54
U.S. Cl. 525—288 7 Claims

1. A method for preventing bleeding of a plasticizer on the surface of a shaped article of a plasticized polyvinyl chloride resin which comprises the steps of

(a) blending from 0.1 to 20 parts by weight of an organosilane compound represented by the general formula

$$CH_2{=}CR^1{-}CO{-}O{-}(CH_2)_a Si(R^2)_b(OR^3)_{3-b}$$

in which R^1 and R^3 are each a hydrogen atom or an alkyl group having from 1 to 4 carbon atoms, R^2 is a monovalent hydrocarbon group, a is an integer from 1 to 6 inclusive and b is a number of 0, 1 or 2, with 100 parts by weight of a polyvinyl chloride resin prior to fabrication of the resin into a shaped article,

(b) fabricating the polyvinyl chloride resin admixed with the organosilane compound into a shaped article, and

(c) subjecting the shaped article to a treatment with low temperature plasma of a gas.

4,233,420

PROCESS FOR PRODUCING CURABLE COATING RESINS

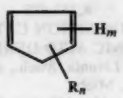
Shozo Tsuchiya, Tokyo; Hideo Hayashi; Makoto Sasaki, both of Yokohama; Kiyoshi Goto, and Kazuyoshi Ihida, both of Tokyo, all of Japan, assignors to Nippon Oil Co., Ltd. and Toyo Ink Manufacturing Co., Ltd., both of Tokyo, Japan

Division of Ser. No. 860,367, Dec. 14, 1977, Pat. No. 4,176,146.
This application Apr. 18, 1979, Ser. No. 30,971
Claims priority, application Japan, Dec. 22, 1976, 51-153436
Int. Cl.[3] C08F 8/04
U.S. Cl. 525—310 6 Claims

1. A process for preparing a radiation or heat curable coating resin (III) comprising the steps of:

hydrogenating selectively the double bonds of a hydroxyl group-containing resin (I) produced by reacting

(A) a compound selected from the group consisting of five-membered cyclic compounds having unsaturated conjugated double bonds and being represented by the following general formula



wherein R is an organic residue having 1 to 3 carbon atoms, and m and n are each an integer and are 6 in total, and Diels-Alder's reaction products of the five-membered cyclic compound, with

(B) at least one member selected from the group consisting of 2-hydroxyethyl (meth)acrylate and 2-hydroxypropyl (meth)acrylate, to obtain a hydrogenated hydroxyl group-containing resin (II) and then

esterifying the thus obtained resin (II) with at least one member selected from the group consisting of acrylic and methacrylic acids thereby to obtain the radiation or heat curable coating resin (III).

4,233,421

FLUOROELASTOMER COMPOSITION CONTAINING SULFONIUM CURING AGENTS

Allan T. Worm, North St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

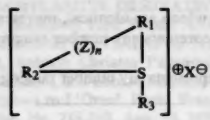
Filed Feb. 26, 1979, Ser. No. 15,171
Int. Cl.[3] C08F 8/40, 8/34, 14/22
U.S. Cl. 525—343 7 Claims

1. An admixture curable in reactive association with an inorganic acid acceptor to product a cured elastomer and comprising the following components:

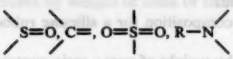
(a) an elastomeric copolymer of vinylidene fluoride and at least one terminally unsaturated fluoromonolefin containing at least one fluorine atoms substituent on each double bonded carbon atom, each cabon atom of said fluoromonoolefin being substituted only with fluorine, chlorine, hydrogen or lower fluoroalkyl or fluoroalkoxy radical, at least 10 percent of the chain carbon atoms of said copolymer being —CH_2— units;

and as co-curatives for said copolymer:

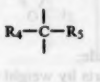
(b) at least one triorgano sulfonium compound in which at least one sulfur atom is covalently bonded to three organic moieties having 1 to 20 carbon atoms by means of carbon-sulfur covalent bonds and is ionically associated with an anion, wherein the sulfonium compound is an aromatic sulfonium salt of the formula



wherein R_1, R_2 and R_3 are selected from the group consisting of aromatic groups having 4 to 20 carbon atoms and alkyl radicals having 1 to 20 carbon atoms; wherein at least one of R_1, R_2, and R_3 is aromatic; wherein Z is selected from the group consisting of oxygen, sulfur,



where R is aryl or acyl, a carbon-to-carbon bond, or



where R_4 and R_5 are selected from the group consisting of hydrogen, an alkyl radical having 1 to 4 carbon atoms, and an alkenyl radical having 2 to 4 carbon atoms; n is 0 or 1; and X is an anion, and

(c) at least one aromatic polyhydroxy compound.

4,233,422

PROCESS FOR STABILIZING ACETAL CARBOXYLATE POLYMERS USING DIALKYL SULFATE

David R. Dyroff, Creve Coeur, and Gary J. Lynch, St. Louis, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Sep. 24, 1979, Ser. No. 78,274

Int. Cl.³ C08G 6/00; C08L 61/02

U.S. Cl. 525—398 **8 Claims**

1. In a process for preparing an acetal carboxylate polymer wherein an ester of glyoxylic acid and a polymerization initiator are brought together under polymerization conditions, and a chemically stable end group is added to the termini of the resulting polymer to stabilize the polymer against rapid depolymerization in alkaline solution, the improvement which comprises adding to the resulting polymer a sufficient amount of an alkali metal hydride and a dialkyl sulfate having 1 to about 20 carbon atoms in each alkyl group to add to the termini of the resulting polymer an alkyl group derived from the dialkyl sulfate.

4,233,423

STABILIZATION OF POLYMERIC ACETAL CARBOXYLATES USING AN ACETAL

David R. Dyroff; Creve Coeur; Gary J. Lynch, St. Louis County, and Victor D. Papanu, Maryland Heights, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Nov. 5, 1979, Ser. No. 91,656

Int. Cl.³ C08G 6/00; C08L 61/02

U.S. Cl. 525—398 **8 Claims**

1. In a process for preparing an acetal carboxylate polymer wherein a glyoxylate ester and a polymerization initiator are brought together under polymerization conditions, and a chemically stable end group is added to the termini of the resulting polymer to stabilize the polymer against rapid depolymerization in alkaline solution, the improvement which comprises contacting the resulting polymer in the presence of an acid catalyst with a sufficient amount of an acetal having the formula:

wherein R is hydrogen or alkyl having from 1 to about 6 carbon atoms, and R^1 and R^2 are individually an alkyl having from 1 to about 6 carbon atoms, to stabilize the resulting polymer against rapid depolymerization in alkaline solution, and an agent to remove liberated alcohol.

4,233,424

PROCESS FOR THE PRODUCTION OF BEAD POLYMERS

Carlhans Süling, Odenthal; Gerhard Balle, Leverkusen; Michael Walkowiak, Cologne, and Hans-Hermann Schulz, Leichlingen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 25, 1978, Ser. No. 899,980

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1977, 2719149

Int. Cl.³ C08L 75/00

U.S. Cl. 525—440 **17 Claims**

1. A two-phase bead polymer having an average bead diameter of 10 to 120μ and comprising:

(A) 88 to 99.5% by weight of a polymer of polymerized units of at least one methacrylic acid ester containing from 1 to 10 carbon atoms in the aliphatic, saturated alcohol component, the methacrylic ester polymer optionally containing up to 30% by weight of copolymerized units of at least one monomer selected from acrylic acid esters containing from 1 to 10 carbon atoms in the aliphatic saturated alcohol component, hydroxyalkyl esters of methacrylic acid containing from 2 to 4 carbon atoms in the alkyl group, styrene, vinyl acetate, (meth)acrylamide, (meth)acrylic acid and/or itaconic acid, and

(B) 0.5 to 12% by weight of a linear polyurethane produced by polyaddition of

(a) one or more substantially linear bifunctional hydroxyl compounds having a molecular weight of from 400 to 6000 and a glass transition temperature of $\leqq -20°$ C. and selected from polyesters, polyethers, polyacetals, polycarbonates, polyester amides and polyamides,

(b) one or more aliphatic or cycloaliphatic diisocyanates,

(c) one or more bifunctional hydroxyl compounds having a molecular weight of $\leqq 400$, and

(d) a saturated or olefinically unsaturated compound monofunctionally reactive to isocyanates.

4,233,425

ADDITION POLYMERIZABLE POLYETHERS HAVING PENDANT ETHYLENICALLY UNSATURATED URETHANE GROUPS

Nancy B. Tefertiller; Kenneth A. Burdett, and Robert F. Harris, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Nov. 15, 1978, Ser. No. 961,000

Int. Cl.² C08L 75/08

U.S. Cl. 525—455 **9 Claims**

1. An addition polymerizable polyether having a polyether backbone bearing at least one pendant group which is an oxycarbonylamino aliphatic ester of an α,β-ethylenically unsaturated carboxylic acid.

4,233,426
CHANNEL SEALANT COMPOSITIONS

Warren R. Griffin, Dayton, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Division of Ser. No. 830,227, Sep. 2, 1977, Pat. No. 4,185,041. This application Apr. 4, 1979, Ser. No. 26,866

Int. Cl.[3] C08L *83/08, 75/04*

U.S. Cl. 525—477 **15 Claims**

1. A channel sealant composition consisting essentially of (1) a non-crosslinked, hydrocarbon fuel-resistant, elastomeric mastic having the consistency of a caulking compound, said elastomeric mastic comprising an elastomer selected from the group consisting of fluorosilicone and cyanosilicone elastomers and (2) an extrusion-inhibiting amount of vulcanized elastomeric particles of irregular shape and having sharp edges and angular surfaces, the particles being formed from a vulcanizate of a hydro-carbon fuel-resistant elastomer selected from the group consisting of fluorosilicone and cyanosilicone elastomers, said vulcanizate having a tensile strength of at least 1000 psi and a hardness of at least 80 Shore A points.

4,233,427
ELASTOMERIC ORGANOPOLYSILOXANE BLOCK COPOLYMERS AND NON-ELASTOMERIC ORGANOSILICIC COPOLYMER BLOCKS THEREFOR

Michel Bargain, and Christian Prud'Homme, both of Lyon, France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Jan. 16, 1979, Ser. No. 3,885

Claims priority, application France, Jan. 16, 1978, 78 01048

Int. Cl.[3] C08G *77/42, 77/20, 77/12*

U.S. Cl. 525—478 **34 Claims**

1. A thermoplastic, crystalline block copolymer comprising a plurality of recurring units selected from the group consisting of those of the structural formulae F_1 and F'_1, and combinations thereof:

$$F_1\text{:}-\!\!+\!A[SiR_2(GSiR_2)_aASiR_2G'SiR_2A]_pSiR_2(GSiR_2)_aASiR_2(OSiR_2)_n\!\!+$$

and

$$F'_1\text{:}-\!\!+\!A[SiR_2G'SiR_2ASiR_2(GSiR_2)_aA]_pSiR_2G'SiR_2ASiR_2(OSiR_2)_n\!\!+$$

in which the symbols A, which are identical, represent linear or branched chain alkylene radicals having from 2 to 6 carbon atoms, or cyclohexylene radicals;

the symbols R, which are identical or different, represent alkyl and halogenoalkyl radicals having from 1 to 5 carbon atoms, cycloalkyl and halogenocycloalkyl radicals having from 3 to 8 carbon atoms, aryl and halogenoaryl radicals having from 6 to 8 carbon atoms or cyanoalkyl radicals having from 3 to 4 carbon atoms;

the symbols G, which are identical, represent linear or branched chain alkylene radicals having from 1 to 8 carbon atoms, divalent organic radicals corresponding to the formula $F_2\text{:}-\!\!+CH_2)_xQTQ(CH_2\!\!+_x$, in which the symbols Q, which are identical, represent one of the groups —O— and —OCO—, the —OCO— being bonded to T by the —CO— radical, the symbol T represents a monocyclic, divalent hydrocarbon radical having from 6 to 8 carbon atoms, or a divalent organic radical which has from 10 to 22 carbon atoms and consists of 2 hydrocarbon rings which are fused to one another or bonded together by a valence bond or by one of the groups of the formulae —O—, —CH_2—, —$C(CH_3)_2$— and —$Si(R'\!\!+_2$, wherein R' is an alkyl radical having from 1 to 3 carbon atoms, and the symbols x, which are identical, represent 1, 2 or 3, or divalent hydrocarbon radicals corresponding to the formula $F_3\text{:}-\!\!+CH_2)_bT(CH_2)_b$, in which the symbol T has the meaning given for the formula F_2 and the symbols b, which are identical, represent 0 or 1;

the symbols G', which are identical, have the meaning given above for G, except that they do not correspond to the formula F_2;

the symbols a, which are identical, represent 0 or 1;

the symbol p represents any number ranging from 1 to 120; and

the symbol n represents any number ranging from 1 to 1,500.

4,233,428
PRIMER COMPOSITIONS FOR SILICONE RUBBER COMPOSITIONS

Isao Endo, Oota, Japan, assignor to General Electric Company, Waterford, N.Y.

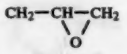
Filed Dec. 4, 1978, Ser. No. 966,244

Int. Cl.[3] C08L *63/02, 63/04, 83/06*

U.S. Cl. 525—507 **18 Claims**

1. A primer composition for a silicone rubber composition comprising,

(a) 100 parts by weight of epoxy resin containing more than 2 radicals expressed by the formula



within each molecule;

(b) from 50 to 500 parts by weight of a silane containing an amino group expressed by the formula $R^1CH_2CH_2CH_2Si(OR^2)_3$ wherein R^1 is a nitrogen-containing group selected from the class consisting of substituted or unsubstituted amino groups expressed by $Q_2{}^1N$ and $Q_2{}^2N(CH_2)_2NH$ wherein Q^1 and Q^2 are groups selected from the class consisting of a hydrogen atom and an alkyl radical respectively, and R^2 is a monovalent hydrocarbon group;

(c) from 30 to 500 parts by weight of an organic silicon compound containing the group expressed by the formula $R_2{}^3NOSi\equiv$ wherein R^3 is a group selected from the class consisting of a hydrogen atom and a monovalent hydrocarbon group with no aliphatic unsaturation;

(d) from 100 to 1000 parts by weight of a mercapto-containing silane expressed by the formula $HS(CH_2)_aSi(OR^4)_3$ wherein a has a value of either 2 or 3, and R^4 is a monovalent hydrocarbon group; and

(e) an organic solvent.

4,233,429
PROCESS FOR REMOVING VOLATILES EVOLVED FROM PLASTIC MELTS

Werner Hoerauf; Guenter Valentin, both of Ludwigshafen; Robert Kegel, Frankenthal, and Helmut Kuhn, Gruenstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 25, 1978, Ser. No. 927,848

Claims priority, application Fed. Rep. of Germany, Aug. 3, 1977, 2734946

Int. Cl.[3] C08G *69/14*

U.S. Cl. 526—71 **4 Claims**

1. In a process for removing volatile constituents which are evolved from a plastic melt when said melt is extruded from apparatus having means to melt said plastic through a heated extrusion die orifice and which escape into open air surrounding said extrusion die orifice, the improvement wherein the volatile constituents are drawn off immediately as they are evolved together with said air surrounding said extrusion die orifice through at least one suction orifice located in the immediate neighborhood of said die orifice and wherein the air drawn off and the volatile constituents therein are heated immediately after entering said suction orifice by the means used to melt said plastic melt.

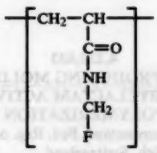
4,233,430

ANTI-SOLAR ACRYLAMIDE DERIVATIVE POLYMERS, METHOD OF MAKING THE SAME AND COSMETIC COMPOSITIONS CONTAINING THE SAME

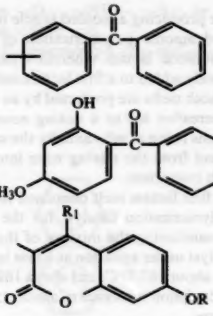
Bernard Jacquet, Antony; Christos Papantoniou, Epinay-sur-Seine; Pierre Dufaure, and Claude Mahieu, both of Paris, all of France, assignors to L'Oreal, Paris, France

Division of Ser. No. 715,565, Aug. 18, 1976, which is a continuation-in-part of Ser. No. 374,058, Jun. 27, 1973, Pat. No. 3,980,617. This application May 1, 1979, Ser. No. 35,009
Claims priority, application France, Jun. 26, 1973, 73 23254; Jul. 29, 1976, 76 23174
Int. Cl.[2] A61K 7/44, 7/42
U.S. Cl. 526—259 11 Claims

1. Anti-solar polymer having in the macromolecular chain from 10–100 percent by weight of units of the formula



wherein F is selected from the group consisting of

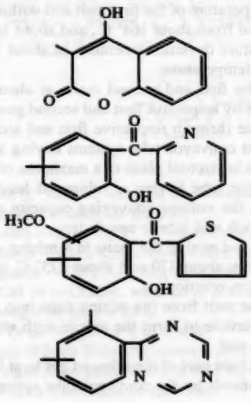


(1)

(2)

(3)

wherein R is selected from the group consisting of hydrogen and CH_3 and R_1 is selected from the group consisting of CH_3 and OCH_3



(4)

(5)

(6)

(7)

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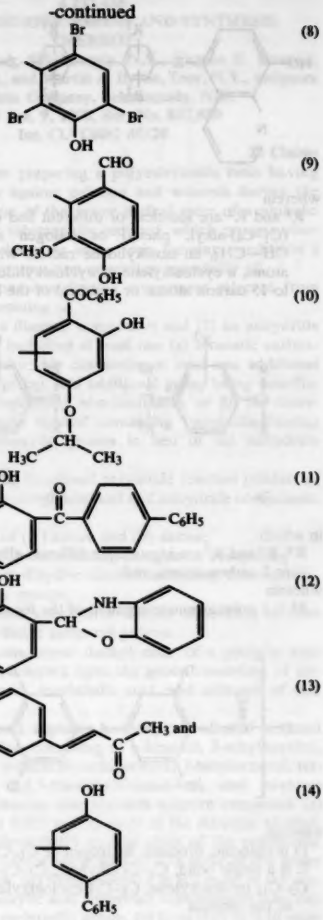


(8)

(9)

(10)

(11)

(12)

(13)

(14)

and from 90–0 percent by weight of units derived from an ethylenically unsaturated monomer,

said polymer having an average molecular weight between about 2,000–1,000,000.

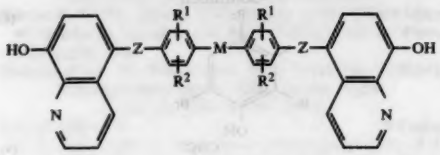
4,233,431

POLYCONDENSATES CONTAINING HYDROXYQUINOLINE END GROUPS, THEIR USE FOR THE PREPARATION OF POLYMERS CONTAINING METALS AND METAL CONTAINING POLYCONDENSATES

Karsten Idel, Krefeld; Hugo Vernaleken, Krefeld-Bockum; Dieter Freitag, Krefeld, all of Fed. Rep. of Germany; Günther Reiff, Santa Maria, Brazil, and Hans Rudolph, Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

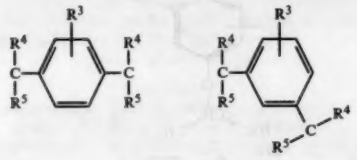
Continuation of Ser. No. 549,282, Feb. 12, 1975, abandoned. This application Jan. 6, 1977, Ser. No. 757,133
Claims priority, application Fed. Rep. of Germany, Feb. 15, 1974, 2407308; Feb. 15, 1974, 2407309
Int. Cl.[2] C08L 63/62
U.S. Cl. 525—462 19 Claims

1. Polycondensates of the formula



wherein

R^1 and R^2 are identical or different and denote hydrogen, (C_1–C_4)-alkyl, phenyl or halogen and Z is CH_2, CH—CH_3, an isoalkylidene radical with 3 to 5 carbon atoms, a cycloalkylene or cycloalkylidene radical with 5 to 15 carbon atoms, or a radical of the formula



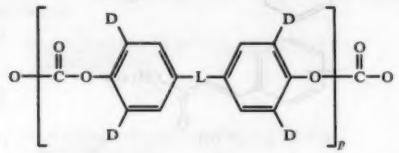
2a 2b

in which

R^4, R^5 and R^3 are identical or different alkyl radicals with 1 to 5 carbon atoms, and

wherein

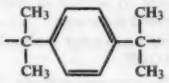
M is a polycarbonate segment of the formula



wherein

D is chlorine, bromine, hydrogen or C_1–C_4 alkyl,

L is a single bond, C_1–C_5 alkylene, C_2–C_5-alkylidene, C_5–C_{15} cycloalkylene, C_5–C_{15} cycloalkylidene or a radical of the formula



and p is an integer between 2 and 50.

4,233,432

DICYCLOPENTADIENE POLYESTER RESINS

Omer E. Curtis, Jr., Morristown, N.J., assignor to United States Steel Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 824,898, Aug. 15, 1977, abandoned, which is a continuation of Ser. No. 709,085, Jul. 27, 1976, abandoned. This application May 10, 1979, Ser. No. 37,616

Int. Cl.[2] C08G *63/52*

U.S. Cl. 528—298 **9 Claims**

1. Method for preparing an unsaturated polyester comprising the steps of:

(a) reacting about 100 moles of a polycarboxylic acid component containing at least about 25 moles maleic acid with about 50 to about 200 moles of dicyclopentadiene at a temperature of about 90° C. to about 150° C. for a sufficient period of time to provide a reaction product comprising at least 25 mole % half maleic ester of dicyclopentyl alcohol;

(b) further reacting the reaction product of step (a) with about 25 to about 100 moles of a polyol or mixture of polyols per 100 moles of polycarboxylic acid in step (a), at a temperature of at least about 180° C. until the acid number of the resultant unsaturated polyester is less than about 55.

4,233,433

PROCESS FOR PRODUCING MOLDED ARTICLES FROM POLYLAURYLLACTAM ACTIVATED ANIONIC POLYMERIZATION

Werner Hartmann, Immenstaad, Fed. Rep. of Germany, assignor to Harwe AG, Zurich, Switzerland

Continuation-in-part of Ser. No. 579,620, May 21, 1975, abandoned. This application Jun. 29, 1977, Ser. No. 811,057

Int. Cl.[3] C08G *69/18*

U.S. Cl. 528—326 **6 Claims**

1. In a process for producing a molded article of a polylauric lactam by activated anionic polymerization of at least one corresponding monomeric lactam wherein a catalyst and an activator are separately added to a first lactam melt and second lactam melt, while both melts are protected by an inert gas, and which melts are thereafter fed to a mixing zone by separate conveyor tube systems being at substantially the same temperature as the melts, and from the mixing zone into a mold, the improvement which comprises:

(a) adding to the first lactam melt contained in a first vessel at lest one polymerization catalyst for the lactam with agitation and maintaining the mixture of the lactam melt and added catalyst under agitation at a first temperature in the range from about 167.5° C. and about 169.5° C., and at a temperature deviation tolerance of about ±1° C. for said first temperature;

(b) adding, following the addition of the catalyst to the first lactam melt, at least one activator for the polymerization of the lactam to the second lactam melt under agitation and maintaining the mixture of the second lactam melt and activatoor stirred at a second temperature which is lower than the temperature of the first melt and within a temperature range of from about 164° C., and about 166° C., and at a temperature deviation tolerance of about ±1° C. for said second temperature;

(c) pumping the first and second melts at about the melt temperatures by respective first and second gear pumps to a mixing zone through respective first and second essentially straight conveyor tube systems having an angle of incline to the horizontal plane of a maximum of about 10°, each conveyor tube having a volume at least one-third greater than the volume conveying capacity of the gear pump to which said tube is coupled;

(d) combining and mixing the melts in a mixing zone maintained between about 170 and about 175° C. to initiate a polymerization reaction;

(e) injecting the melt from the mixing zone into a mold for the molded article to form the article with attendant release of gas; and

(f) returning at least part of the released gas to at least one of the mixing vessels by the conveyor tube systems.

4,233,434

POLYAMIDE FROM AROMATIC PHOSPHORUS CONTAINING DIAMINE

Menahem A. Kraus, 14 Mordel Hagetaot St.; Moshe A. Frommer, 2a Eisenberg St., both of Rehovot; Mara Nemas, 28 Tamar St., Neve Monoson, and Rodika Gutman, 77 Hashiloah St., Kiryat Sharet, all of Israel

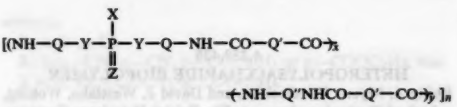
Continuation-in-part of Ser. No. 652,812, Jan. 27, 1976. This application May 9, 1978, Ser. No. 904,286

Claims priority, application Israel, Jan. 27, 1975, 46510; Jul. 15, 1975, 47709

Int. Cl.[3] C08G 69/42

U.S. Cl. 528—337 19 Claims

1. A polymer consisting essentially of the following repeating unit:



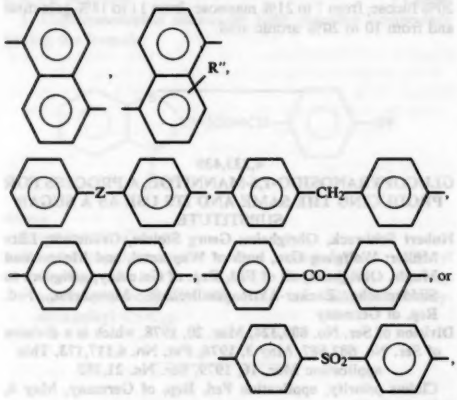
wherein

X designates —NHAr, N(R)Ar, —NRR′, NHR, —OR, —OAr, or SR,

Y designates —O—, —NH—, —S—, or —N(CH3)—,

Z designates =O or =S,

Q, Q′ and Q″ designate p-C_6H_4, m-C_6H_4, R″C_6H_3,



which

Q, Q′, and Q″ may be identical or different,

Ar designates —C_6H_5, or RC_6H_4,

R designates —CH_3, C_2H_5, or —n—C_3H_7,

R′ designates —CH_3, C_2H_5, or —C_3H_7, and

R″ designates —CH_3, —C_2H_5, n—C_3H_7, —OCH_3, —OH, —COOH or —COOR, wherein R is as defined above,

x is an integer of from 1 to 5,

y is zero or an integer of 1 to 5, and

n is an integer of from 50 to 200; wherein the repeating portions within the right-hand parentheses of said repeating unit when y is greater than 1 are alike or different.

4,233,435

POLYESTERIMIDE RESINS AND SYNTHESIS THEREOF

Edith M. Boldebuck, Schenectady, N.Y.; Eugene G. Banucci, Mt. Vernon, Ind., and Martin A. Byrne, Troy, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jan. 9, 1978, Ser. No. 867,939

Int. Cl.[3] C08G 69/26

U.S. Cl. 528—350 24 Claims

1. A process for preparing a polyesterimide resin having increased stability against gelation and wherein during the process, sublimation of the lower dialkyl ester of a phthalic acid component is substantially reduced, which process comprises reacting under ester imide resin forming conditions a reaction mixture composition consisting essentially of:

(I) an imide-group-contributing component selected from the group consisting of

(A) both (1) a diamine component and (2) an anhydride component including at least one (a) aromatic carboxylic acid anhydride containing at least one additional carboxylic group, said additional group being esterifiable and substantially non-imidizable, or (b) the corresponding acid thereof containing two-imide-forming vicinal carboxylic groups in lieu of the anhydride group.

(B) the carboxy functional polyimide reaction product of said diamine component and said anhydride component, and

(C) mixtures of (A) above and (B) above;

(II) an ester-group-contributing component comprising

(D) at least one dihydric alcohol containing two esterifiable hydroxy groups,

(E) at least one polyhydric alcohol containing at least three esterifiable hydroxyl groups,

(F) at least one lower dialkyl ester of a phthalic acid component selected from the group consisting of terephthalic acid, isophthalic acid, and mixtures of said acids; and

(G) a saturated aliphatic monohydric alcohol selected from the class consisting of n-hexanol, 2-ethylhexanol, n-nonanol n-decanol, n-dodecanol, 2-butyloctanol, tetradecanol, 2,6,8-trimethylnonane-4-ol, and mixtures thereof, wherein said reaction mixture comprises (a) from about 0.035 to 0.25 mole of the dihydric alcohol, (b) from about 0.025 to 0.15 mole of the polyhydric alcohol, (c) from about 0.03 to 0.18 mole of the lower dialkyl ester, (d) from about 0.1 to 0.2 mole of the aromatic carboxylic acid anhydride containing at least one additional carboxylic group, (e) from 0.05 to 0.10 mole of the diamine component, and from about 1.0 to 20.0 parts of the monohydric alcohol, said amounts being per 100 parts, by weight, of the total weight of the five components (a) through (e) recited herein.

4,233,436

BLOCK POLYMERS OF HYDROXYALKYL PHTHALATE ESTERS AND TETRAHYDROFURAN/ALKYLENE OXIDE COPOLYMERS

Ivan M. Robinson, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 12, 1979, Ser. No. 11,717

Int. Cl.[2] C08G 63/06, 63/60; C08L 67/04

U.S. Cl. 528—366 14 Claims

1. A linear hydroxyl-terminated block polymer represented by the structure

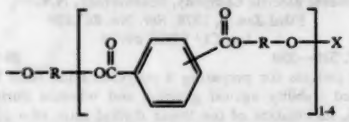
A—B

or

A—B—A

wherein the A block is a copolymer of THF and one or more

alkylene oxides, containing two or three carbon atoms in its oxide ring which block constitutes 30–99% of the weight of the total polymer, and the B block is represented by the structure



wherein

R is $+CH_2+_{2\text{-}6}$

where R_1 and R_2 can be the same or different and can be hydrogen or a linear or branched alkyl radical of 1–6 carbon atoms and

X is hydrogen when the block polymer is in the A—B configuration, and absent when the block polymer is in the A—B—A configuration, which block constitutes 1–70% of the weight of the total polymer,

the polymer having a number average molecular weight of 500–20,000.

4,233,437

CONTINUOUS PROCESS FOR THE REMOVAL OF MONOMERIC IMPURITIES FROM AQUEOUS DISPERSIONS OF HOMO- AND COPOLYMERS OF VINYL CHLORIDE

Josef Kalka, Herten; Bernhard Hentschel, and Jürgen Ziebarth, both of Marl, all of Fed. Rep. of Germany, assignors to Chemische Werke Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

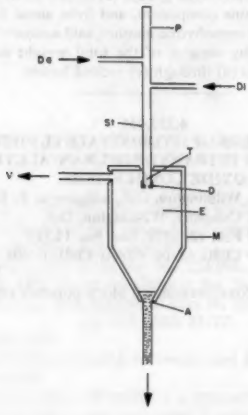
Continuation of Ser. No. 694,342, Jun. 9, 1976, abandoned. This application Feb. 28, 1978, Ser. No. 881,933

Claims priority, application Fed. Rep. of Germany, Jun. 14, 1975, 2526728

The portion of the term of this patent subsequent to Apr. 26, 1994, has been disclaimed.

Int. Cl.³ C08F *6/16, 14/06*

U.S. Cl. 528—500 **4 Claims**



1. In a continuous process for removing monomeric impurites from an aqueous dispersion of homopolymers or copolymers of vinyl chloride having a surface tension below 60 dyn/cm. by treatment with steam while avoiding foam formation by a rapid lowering of the pressure at high flow velocities, the improvement which comprises:

(a) continuously mixing said dispersion in a flow pipe with steam at a temperature of 120°–143° C. and corresponding steam pressure of 1950–3930 millibars for an average residence time of about 0.01-5 seconds;

(b) continuously passing the resultant admixture from said flow pipe at a velocity of at least 30 meters per second directly to a degasification vessel having a pressure of 133–660 millibars; and

(c) continuously recovering a stable polymer dispersion containing less than 20 p.p.m. residual monomer impurities therefrom.

4,233,438

HETEROPOLYSACCHARIDE BIOPOLYMER

Philip A. Myers, Windlesham, and David J. Westlake, Woking, both of England, assignors to The British Petroleum Company Limited, England

Filed Jul. 27, 1977, Ser. No. 819,579

Claims priority, application United Kingdom, Jul. 29, 1976, 31639/76

Int. Cl.³ C08B *37/00*; C07H *1/08*

U.S. Cl. 536—1 **1 Claim**

1. A polyanionic heteropolysaccharide biopolymer having molecular weight in the range of 5.0×10^5 to 2.0×10^8 when measured by gel permeation chromatography and comprising the saccharide residues glucose, fucose, mannose, galactose and uronic acid in the following proportions based on weight of total saccharide content: from 38 to 48% glucose; from 11 to 20% fucose; from 7 to 21% mannose; from 11 to 18% galactose and from 10 to 20% uronic acid.

4,233,439

GLUCOPYRANOSIDO-1,6-MANNITOL, A PROCESS FOR PRODUCING THE SAME AND ITS USE AS A SUGAR SUBSTITUTE

Hubert Schiweck, Obrigheim; Georg Steinle, Grünstadt; Lütz Müller; Wolfgang Gau, both of Wuppertal, and Mohammad Munir, Obrigheim, all of Fed. Rep. of Germany, assignors to Süddeutsche Zucker-Aktiengesellschaft, Mannheim, Fed. Rep. of Germany

Division of Ser. No. 888,324, Mar. 20, 1978, which is a division of Ser. No. 682,667, May 3, 1976, Pat. No. 4,117,173. This application Mar. 16, 1979, Ser. No. 21,252

Claims priority, application Fed. Rep. of Germany, May 6, 1975, 2520173

Int. Cl.³ C07H *15/00, 17/00*

U.S. Cl. 536—4 **3 Claims**

1. A process for producing glucopyranosido-1,6-mannitol, comprising hydrogenating neutral aqueous solutions of isomaltulose having an isomaltulose content of greater than 50% by weight in the presence of a hydrogenation catalyst under a hydrogen pressure of from 30 to 100 kg/cm² at a temperature of from 100° to 130° C. for a time sufficient to complete hydrogenation; thereafter cooling the hydrogenated solution to cause said glucopyranosido-1,6-mannitol to crystallize as a first substance from said solution and separating the glucopyranosido-1,6-mannitol from the resulting suspension.

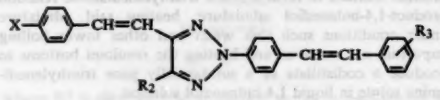
4,233,440

TRIAZOLYL-STILBENES

Alfons Dorlars, Leverkusen, and Otto Neuner, Bergisch-Gladbach, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 894,556, Apr. 7, 1978, abandoned, which is a continuation of Ser. No. 419,665, Nov. 28, 1973, abandoned. This application Apr. 23, 1979, Ser. No. 32,255
Claims priority, application Fed. Rep. of Germany, Nov. 28, 1972, 2258276
Int. Cl.³ C07D *249/06*
U.S. Cl. 542—458 12 Claims

1. A triazolyl-stilbene of the formula



wherein

R_2 is H or Cl,

R_3 is p—CN, o—CN, p—$COOCH_3$ or p—$COOC_2H_5$, and

X is H, Cl, $COOCH_3$ or $COOC_2H_5$.

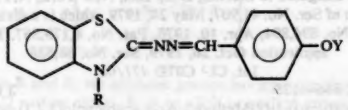
4,233,441

COPOLYMERIZABLE, ULTRAVIOLET LIGHT ABSORBER 4-ACRYLOXYBENZAL-3-ALKYL-2 N-BENZOTHIAZOLOAZINES

Bruce A. Gruber, Worthington, Ohio, and Donald H. Lorenz, Basking Ridge, N.J., assignors to GAF Corporation, New York, N.Y.

Filed Oct. 31, 1979, Ser. No. 90,046
Int. Cl.³ C07D *277/82*
U.S. Cl. 542—419 7 Claims

1. Copolymerizable ultraviolet light absorber compounds having the formula:



where

R is alkyl C_1–C_6; and

Y is a copolymerizable radical selected from acryloyl C_3–C_{12}, alkylacryoyl C_3–C_{12}, acryloxyalkyl C_3–C_{12}, acryloxyhydroxyalkyl C_3–C_{12}, and alkylacryloxyhydroxyalkyl C_3–C_{12}.

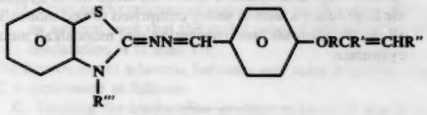
4,233,442

COPOLYMERIZABLE, ULTRAVIOLET LIGHT ABSORBER 4-ALLYLOXYBENZAL-3'-ALKYL-2'-BENZOTHIAZOLOAZINES

Bruce A. Gruber, Worthington, Ohio, and Donald H. Lorenz, Basking Ridge, N.J., assignors to GAF Corporation, New York, N.Y.

Filed Oct. 31, 1979, Ser. No. 90,047
Int. Cl.³ C07D *277/82*
U.S. Cl. 542—419 10 Claims

1. Copolymerizable ultraviolet light absorber compounds having the formula:



where R is alkylene, C_1–C_{10}, oxyalkylene, C_1–C_{10} alkyleneoxyalkylene, C_1–C_{10}, phenylene, C_1–C_{10}, unsubstituted or substituted with hydroxy;

R′ and R″ are independently hydrogen or alkyl, C_1–C_6; and

R‴ is alkyl C_1–C_6.

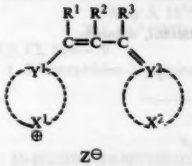
4,233,443

NOVEL RADIATION SENSITIVE COMPOUNDS AND RADIATION SENSITIVE COMPOSITIONS CONTAINING THE SAME

Constantine C. Petropoulos, Webster; George A. Reynolds, and James A. VanAllan, both of Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 813,371, Jul. 6, 1977, Pat. No. 4,173,473. This application Mar. 26, 1979, Ser. No. 24,280
Int. Cl.² C07C *407/06*, *407/10*
U.S. Cl. 542—454 8 Claims

1. A pyrylium-type salt having the formula:



wherein:

each of X^1 and X^2, which may be the same or different, represents oxygen, sulfur, or selenium;

each of Y^1 and Y^2, which may be the same or different, represents the atoms necessary to complete a heterocyclic unsaturated ring nucleus having 6 or 10 ring atoms including a selenium, sulfur or oxygen hetero ring atom and 5 or 9 carbon ring atoms;

each of R^1, R^2, and R^3, which may be the same or different, represents hydrogen, halogen, cyano, nitro, alkyl having 1 to about 4 carbon atoms in the alkyl group, or aryl, with the proviso that at least one of R^1, R^2, or R^3 represents phenyl or alkoxyphenyl; and

$Z^{\ominus}$ represents an anionic function.

4,233,444

CONTINUOUS PROCESS FOR THE PRODUCTION OF MONOALKALI METAL CYANURATES

David F. Doonan, and Kurt H. Moller, both of Lake Charles, La., assignors to Olin Corporation, New Haven, Conn.

Filed Jul. 2, 1979, Ser. No. 54,334
Int. Cl.³ C07D *251/32*
U.S. Cl. 544—192 12 Claims

1. A continuous process for producing a monoalkali metal cyanurate which comprises:

(a) continuously feeding cyanuric acid and continuously feeding an aqueous solution of an alkali metal hydroxide to a first reactor,

(b) continuously reacting said cyanuric acid and said aqueous solution of alkali metal hydroxide to produce a first slurry comprised of cyanuric acid and a monoalkali metal cyanurate,

(c) continuously conveying a portion of said first slurry to a second reactor,

(d) continuously admixing said portion of said first slurry to further react said cyanuric acid with alkali metal hydroxide to produce a second slurry comprised of said monoalkali metal cyanurate, and recovering said monoalkali metal cyanurate.

4,233,445

7-(SUBSTITUTED)-7H-PYRROLO[3,2-f]-QUINAZOLINE-1,3-DIAMINES

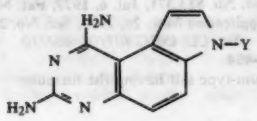
Kurt W. Ledig, deceased, late of Philadelphia, Pa., and by David R. Howes, Executor, Baltimore, Md., assignors to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 920,083, Jun. 28, 1978. This application Jul. 5, 1979, Ser. No. 54,737

Int. Cl.[2] C07D *487/04*

U.S. Cl. 544—250 **3 Claims**

1. A compound of the general formula:



or a non-toxic acid addition salt thereof, wherein:

Y is $-CH_2R$ or $-R^1$

wherein:

R is 4-hydroxyphenyl;

and

R^1 is 4-carbamoylphenyl.

4,233,446

5-CHLORO-7,8-DIHYDRO-7-OXO-PYRIDO[2,3-D]PYRIMIDINE-6-CARBOXYLIC ACID DERIVATIVES

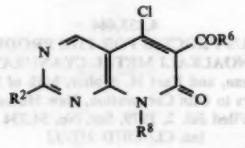
Anthony C. Scotese, King of Prussia; Robert L. Morris, Devon, and Arthur A. Santilli, Havertown, all of Pa., assignors to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 31,256, Apr. 18, 1979. This application Oct. 29, 1979, Ser. No. 89,065

Int. Cl.[3] C07D *471/04*; A61K *31/505*

U.S. Cl. 544—279 **4 Claims**

1. A compound of the formula:



in which

R^2 is hydrogen, hydroxy, alkyl of 1 to 6 carbon atoms, alkylthio of 1 to 6 carbon atoms, phenyl, 4-methoxyphenyl, 4-chlorophenyl, 1-pyrrolidinyl or methylphenylamino;

R^6 is alkoxy of 1 to 6 carbon atoms;

and

R^8 is hydrogen, alkyl of 1 to 6 carbon atoms, 2-alkoxyethyl of 3 to 6 carbon atoms, allyl, propargyl, phenyl, 4-methoxyphenyl, 4-chlorophenyl, benzyl, 4-methoxybenzyl, 4-chlorobenzyl, 4-(4-morpholinyl)-phenyl or piperonyl.

4,233,447

PROCESS FOR PURIFYING TRIETHYLENEDIAMINE

Edward C. Y. Nieh, and Kenneth P. Keating, both of Austin, Tex., assignors to Texaco Development Corp., White Plains, N.Y.

Filed Dec. 21, 1978, Ser. No. 972,098

Int. Cl.[3] C07D *487/00*

U.S. Cl. 544—352 **1 Claim**

1. An improved process for directly recovering a substantially pure triethylenediamine solute in a 1,4-butanediol solution from a crude aqueous triethylenediamine reaction product mixture obtained from a liquid phase process for the preparation of triethylenediamine comprising the steps of admixing said 1,4-butanediol with said crude triethylenediamine reaction product mixture to form a crude triethylenediamine reaction product-1,4-butanediol admixture; heating said admixture under conditions such that water and other lower boiling impurities are removed and heating the resultant bottoms to produce a codistillate of a substantially pure triethylenediamine solute in liquid 1,4-butanediol solution.

4,233,448

3-METHOXYCARBONYL-2-(2-THIENYL)-8-AZABICYCLO[3.2.1]OCTANE-8-ACETAMIDE AND SALTS THEREOF

Robert L. Clarke, Bethlehem, and Sol J. Daum, Albany, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 41,907, May 24, 1979, which is a division of Ser. No. 894,894, Apr. 10, 1978, Pat. No. 4,179,567. This application Oct. 26, 1979, Ser. No. 88,537

Int. Cl.[3] C07D *471/08*

U.S. Cl. 546—125 **1 Claim**

1. (exo,exo)-3-Methoxycarbonyl-2-(2-thienyl)-8-azabicyclo[3.2.1]octane-8-acetamide; or a pharmaceutically acceptable acid-addition salt thereof.

4,233,449

1-(8-METHYL-2-PHENYL(OR THIENYL)-8-AZABICYCLO[3.2.1]OCTAN-3-YL) ETHANONE

Robert L. G. Clarke, Delmar, and Sol J. Daum, Albany, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 41,907, May 24, 1979, which is a division of Ser. No. 894,894, Apr. 10, 1978, Pat. No. 4,179,567. This application Oct. 26, 1979, Ser. No. 88,538

Int. Cl.[3] C07D *471/08*

U.S. Cl. 546—125 **3 Claims**

1. (exo,exo)-1-(8-Methyl-2-Ar-8-azabicyclo[3.2.1]-octan-3-yl)ethanone, wherein Ar is phenyl or 2-thienyl; or a pharmaceutically acceptable acid-addition salt thereof.

4,233,450

PREPARATION OF OXAZOLIDINE-2,4-DIONES

Herbert Scholz, Ludwigshafen, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Fed. Rep. of Germany

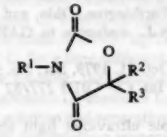
Filed May 18, 1979, Ser. No. 40,282

Claims priority, application Fed. Rep. of Germany, Jun. 22, 1978, 2827414

Int. Cl.[3] C07D *263/44*

U.S. Cl. 548—226 **4 Claims**

1. A process for the preparation of an oxazolidine-2,4-dione of the formula



where R^1 is aryl of 6 to 12 carbon atoms which is unsubstituted or substituted by one or more halogen atoms, methyl or methoxy, R^2 is hydrogen, methoxymethyl, alkyl of 1 to 4 carbon atoms or vinyl and R^3 has the same meanings as R^2 and in any particular compound R^2 and R^3 may be identical or different, wherein a urea derivative of the formula

$$R^1—NH—CO—NH—R^4$$

where R^1 has the above meanings and R^4 has the same meanings as R^1 or is hydrogen, and in any particular compound R^1 and R^4 may be identical or different, is reacted with a 2-hydroxy-carboxylic acid ester of the formula

where R^5 is alkyl of 1 to 10 carbon atoms or cyclohexyl, at from 100° to 250° C.

4,233,451

PROCESS FOR MAKING IMIDAZOLINIUM SALTS

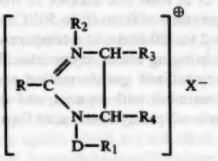
Hans J. Pracht, Sycamore Township, Hamilton County, and Joseph P. Nirschl, Fairfield, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 708,980, Jul. 27, 1976, Pat. No. 4,127,489, which is a continuation-in-part of Ser. No. 687,951, May 20, 1976, abandoned. This application Oct. 20, 1978, Ser. No. 953,065

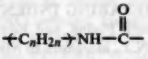
Int. Cl.³ C07D *233/24*

U.S. Cl. 548—354 **18 Claims**

1. In a process for making quaternary imidazolinium salts having the following structure:



wherein R and R_1 are aliphatic groups having from about 10 to about 22 carbon atoms, R_2 is an alkyl or aralkyl group having from 1 to about 8 carbon atoms, R_3 and R_4 are hydrogen, hydroxy, short chain alkyl having from 1 to about 4 carbon atoms or hydroxy short chain alkyl having from 1 to about 4 carbon atoms, X is an anion and D is:



wherein n is a number from 1 to about 6; said process comprising the following steps:

A. Forming a mixture of an acylating or esterifying agent having an aliphatic hydrocarbon group containing from about 10 to about 22 carbon atoms associated with each acyl group and an alkylene or polyalkylene polyamine having two or three amino groups, one of which is a primary or secondary amino group in the 2 position with respect to a primary amino group, the molar ratio of acyl groups to primary amine and hydroxyl groups being from about 0.33:1 to about 1.5:1,

B. Reacting the mixture of step A for a period of from about 3 to about 24 hours at a temperature of from about 100° C. to about 250° C. and then drawing a vacuum of from about 0.4 mm mercury to about 10 mm mercury for from about 1 to about 8 hours to form an imidazoline product in a mixture with starting materials and intermediates;

D. Treating the mixture of step B with an alkylating agent in an amount such that the molar ratio of alkylating agent to imidazoline is at least 1:1;

the improvement wherein, between said steps B and D, a step C is performed as follows:

C. Treating the imidazoline product mixture of step B with an alkoxylating agent, comprising an alkylene oxide selected from ethylene oxide, propylene oxide, butylene oxide, glycide, and cyclohexane oxide, in an amount equal to from about 1% to about 5% by weight of the imidazoline product mixture while maintaining the temperature at from about 80° C. to about 140° C. for a period of from about 0.5 to about 8 hours;

whereby to form a composition comprising quaternary imidazolinium salts which are essentially free of primary and secondary amines, amine salts and alkoxylated imidazolinium salts.

4,233,452

DERIVATIVES OF GLYCOLIC AND GLYOXYLIC ACID AS INHIBITORS OF GLYCOLIC ACID OXIDASE

Haydn W. R. Williams, Dollard des Ormeaux, Canada; Edward J. Cragoe, Jr., Lansdale, and Clarence S. Rooney, Worcester, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 950,753, Oct. 11, 1978. This application May 3, 1979, Ser. No. 35,753

Int. Cl.³ C07D *333/24*; A61K *31/38*

U.S. Cl. 549—79 **1 Claim**

1. 5-Benzylthien-2-ylglyoxylic acid.

4,233,453

15-DEOXY-16-HYDROXY-16-ALLENYL PROSTANE DERIVATIVES OF THE E AND F SERIES

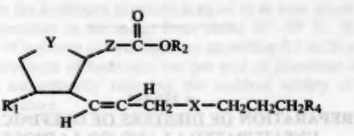
Middleton B. Floyd, Jr., Suffern, N.Y., assignor to American Cyanamid Company, Stamford, Conn.

Filed Jun. 7, 1979, Ser. No. 46,512

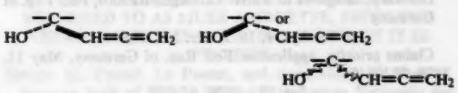
Int. Cl.³ C07L *177/00*

U.S. Cl. 560—121 **4 Claims**

1. An optically active compound of the formula:



wherein X is



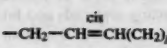
Y is:

R_1 is hydrogen or hydroxyl;

R_2 is hydrogen or C_1 to C_6 alkyl;

R_4 is hydrogen, C_1 to C_3 alkyl, or chlorine;

Z is



wherein p is 2 to 5, and the racemic mixture thereof; and when R_1 is hydrogen, the pharmaceutically acceptable salts thereof.

4,233,454

CYCLOPENTANE ACETIC ACID DERIVATIVES

Keith B. Mallion, Macclesfield, England, assignor to Imperial Chemical Industries Limited, London, England

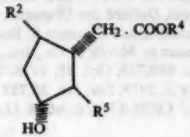
Continuation of Ser. No. 844,388, Oct. 21, 1977, abandoned. This application Sep. 10, 1979, Ser. No. 73,876

Claims priority, application United Kingdom, Nov. 16, 1976, 47663/76; Dec. 8, 1976, 51195/76

Int. Cl.³ C07C *69/738, 69/708, 59/80;* C07D *213/64*

U.S. Cl. 560—122 **3 Claims**

1. A cyclopentane derivative of the formula:



III

wherein R^2 is halogen, R^4 is hydrogen or 1–4C alkyl and R^5 is di(1–4Cor a radical of the formula:

IV

wherein R^1 is 4–7C alkyl, phenoxymethyl or phenoxymethyl substituted in the phenyl part by halogen or trifluoromethyl, or 2-pyridyloxymethyl or 2-pyridyloxymethyl substituted in the pyridyl part by halogen.

4,233,455

PREPARATION OF DIESTERS OF OLEFINICALLY UNSATURATED 1,2 AND/OR 1,4-DIOLS

Hans-Martin Weitz, Bad Duerkheim; Juergen Hartig, Gruenstadt, and Laszlo Marosi, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 4, 1979, Ser. No. 26,995

Claims priority, application Fed. Rep. of Germany, May 11, 1978, 2820519

Int. Cl.³ C07C *67/055*

U.S. Cl. 560—244 **3 Claims**

1. A process for the preparation of diesters of olefinically unsaturated 1,2- and/or 1,4-diols by reacting a diolefin selected from the group consisting of 1,3-butadiene, isoprene, 2,3-dimethyl-1,3-butadiene and a 1,3-pentadiene with oxygen and a fatty acid in the gas phase or liquid phase over a solid catalyst which contains palladium and/or platinum and copper in a reduced form on a solid carrier, said catalyst having been obtained by the reduction of compounds, applied to a carrier, of platinum and/or palladium and of copper, and heating at 400° C. or above.

4,233,456

PROCESS FOR THE MANUFACTURE OF OPTICALLY ACTIVE, OPTIONALLY SUBSTITUTED 2-AMINO-2-PHENYLACETIC ACID

Horst Schmand, Bad Nenndorf, and Wolfgang Dannenberg, Wunstorf, both of Fed. Rep. of Germany, assignors to Riedel-de Haen Aktiengesellschaft, Seelze, Fed. Rep. of Germany

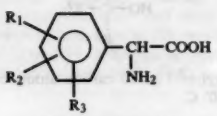
Filed Aug. 28, 1978, Ser. No. 937,093

Claims priority, application Fed. Rep. of Germany, Aug. 30, 1977, 2738934

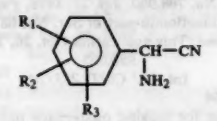
Int. Cl.³ C07B *19/00*

U.S. Cl. 562—401 **9 Claims**

1. A process for the manufacture of an optically active optionally substituted 2-amino-2-phenylacetic acid of the formula



wherein R_1, R_2 and R_3, which are identical or not all the same, are hydrogen, halogen, hydroxy, alkyl, acyl or alkoxy, which consists essentially of reacting a DL-2-amino-2-phenyl-acetonitrile of the formula



with an approximately equimolar amount of L(+)-tartaric acid in the presence of at least one alkanol of from 1 to 5 carbon atoms at a temperature of from 0° to 50° C.; stirring the reaction mixture for 2 to 120 hours at a temperature of from 0° to 50° C., thereby bringing about asymmetrical transformation; separating the crystallized transformation product; hydrolyzing same by a treatment with an acid; and isolating the optically active 2-amino-2-phenylacetic acid form.

4,233,457

PROCESS FOR PREPARING INDENYL ACETIC ACIDS

Robert F. Czaja, Scotch Plains, and Edward J. J. Grabowski, Westfield, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed May 17, 1979, Ser. No. 39,709

Int. Cl.³ C07C *147/14*

U.S. Cl. 562—428 **4 Claims**

1. An improved process for the preparation of 5-fluoro-2-methyl-1-(p-methylsulfinylbenzylidene)-3-indenyl-acetic acid which comprises heating an anhydrous solution of 5-fluoro-2-methyl-1-(p-methylthiobenzyl)indenylidene-3-acetic acid in contact with anhydrous hydrogen bromide, wherein the molar ratio of 5-fluoro-2-methyl-1-(p-methylthiobenzyl)indenylidene-3-acetic acid to hydrogen bromide is between 1 to 0.1 and 1 to 0.5, and the temperature is maintained between 50°–100° C. in a sealed container, to produce 5-fluoro-2-methyl-1-(p-methylthiobenzyledene)indenyl-3-acetic acid, and submitting said indenyl-3-acetic acid to oxidation.

4,233,458
PROCESS FOR PREPARING N,N-DIMETHYLAMINOBENZOIC ACIDS

John H. Bright, Kendall Park, N.J., and Joseph L. Schmitt, Jr., Bethel, Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jul. 28, 1978, Ser. No. 928,950
Int. Cl.[3] C07C *99/00*
U.S. Cl. 562—458 10 Claims

1. A process for the manufacture of 3-dimethylaminobenzoic acid which comprises (1) a first step of reacting a methanolic solution of one molar proportion of 3-nitro-benzoic acid with three molar proportions of hydrogen under superatmospheric pressure and at a temperature of about 10°–100° C. in the presence of an effective amount of palladium metal catalyst and optionally from about 0.1 to 5.0 percent by weight, based on the weight of the nitrobenzoic acid of acetic acid; (2) a second step of adding thereto about two molar proportions of formaldehyde and reacting the resulting mixture with an additional two molar proportions of hydrogen under superatmospheric pressure at a temperature of about 15°–100° C.; (3) filtering the resulting methanolic solution of 3-dimethylaminobenzoic acid from the catalyst and recovering 3-dimethylaminobenzoic acid therefrom.

4,233,459
CONTINUOUS MANUFACTURE OF ANTHRANILIC ACID

Gerhard Kilpper, Battenberg, and Johannes Grimmer, Ludwigshafen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 28, 1979, Ser. No. 24,829
Claims priority, application Fed. Rep. of Germany, Apr. 11, 1978, 2815522
Int. Cl.[2] C07C *99/00, 99/12*
U.S. Cl. 562—458 15 Claims

1. A process for the continuous manufacture of anthranilic acid by reacting an alkali metal phthalamate, phthalimidate, or a mixture thereof, with a hypohalite in an aqueous medium in a reaction tube, wherein, during the reaction forming the anthranilic acid or after completion of the reaction,

(1) in a first step, the anthranilic acid so obtained is treated with reducing agents which are not alkali metal dithionite or alkali metal formaldehyde-sulfoxylates and

(2) in a second step the treated anthranilic acid is then further treated with an alkali metal dithionite, an alkali metal formaldehyde-sulfoxylate or a mixture thereof.

4,233,460
ALKOXYALKANOIC ACID PREPARATION

Carl L. Willis, and Lynn H. Slaugh, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed May 3, 1979, Ser. No. 35,871
Int. Cl.[2] C07C *51/26*
U.S. Cl. 562—537 3 Claims

1. A process for preparing an alkoxyalkanoic acid of the formula:

$$RO(CH_2CHR'O)_nCH_2CO_2H$$

wherein R is an alkyl group of 1 to about 22 carbon atoms, R' is hydrogen or methyl or a mixture thereof (on the individual molecule) and n is an integer of from 1 to about 12 by reacting the corresponding alkoxyalkanol with tertiary butyl hydroperoxide and an alkali metal hydroxide in the liquid phase at a temperature of about 20° to about 100° C. in the presence of a catalytically effective amount of palladium metal while maintaining during the reaction an excess of the alkali metal hydroxide.

4,233,461
PROCESS FOR PREPARING COLORLESS METHIONINE

Toshio Kawabata, and Toshio Ishiyama, both of Niihama, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Mar. 27, 1979, Ser. No. 24,462
Claims priority, application Japan, Apr. 3, 1978, 53/39598
Int. Cl.[3] C07C *149/247*
U.S. Cl. 562—554 10 Claims

1. A process for preparing colorless methionine from the aqueous solution of alkali salts of methionine prepared by hydrolysis of 5-(β-methylmercaptoethyl)-hydantoin with an alkali, which comprises treating the said solution with a reducing sulfur compound before or during neutralizing the said solution with an acid ,and thereafter collecting colorless methionine from the resulting decolorized solution of methionine, the reducing sulfur compound being sulfur dioxide, monosulfites, disulfites, bisulfites, thiosulfates, dithionites or a mixture thereof.

4,233,462
PEROXYGEN COMPOUNDS

Robert C. P. Cubbon, Kingsley; John E. Braid, Croft, Nr. Warrington; Alfred E. Oates, Luton, and Ronald Preston, Eccleston, all of England, assignors to Laporte Chemicals Limited, England

Continuation of Ser. No. 48,531, Jun. 22, 1970, abandoned, which is a division of Ser. No. 660,199, Aug. 14, 1967, Pat. No. 3,787,503. This application Sep. 26, 1974, Ser. No. 509,715
Claims priority, application United Kingdom, Aug. 16, 1966, 36641/66
Int. Cl.[3] C07C *179/025*
U.S. Cl. 568—564 22 Claims

1. A process for the preparation of a straight or branched chain ketone hydroperoxide of 4 to 6 carbon atoms substituted by alkoxy of 1 to 4 carbon atoms or hydroxy in the position α, β or γ to the ketone peroxide which consists essentially of treating at a temperature not exceeding 35° C. the corresponding ketone with aqueous hydrogen peroxide and a source of hydrogen ions providing 0.0001 to 1.75 gram atoms of hydrogen ion per gram mole of ketone.

18. A process for preparing a peroxide composition, which comprises reacting diacetone alcohol with an aqueous solution of hydrogen peroxide wherein the molar ratio of the ketone alcohol to the hydrogen peroxide is equal to at least about 1:2, at a temperature in the range from about 10°–30° C., in the presence of a source of hydrogen ion providing 0.1 to 50 milligram equivalents of hydrogen ion per mol of diacetone alcohol, and subsequently reducing the residual acidity of the reaction mixture.

4,233,463
PROCESS FOR THE SEPARATION OF 2,4-DINITRO-6-T-BUTYL-3-METHYLANISOLE, REFERRED TO AS MUSK AMBRETTE, FROM THE CRUDE SYNTHESIS MIXTURES IN WHICH IT IS PRESENT

Helene M. Pascal, Le Pontet, and Jean-Marie L. Emeury, Sorgues, both of France, assignors to Societe Nationale des Poudres et Explosifs, Paris, France

Filed Dec. 18, 1978, Ser. No. 970,131
Claims priority, application France, Dec. 29, 1977, 77 39624
Int. Cl.[3] C07C *79/35*
U.S. Cl. 568—584 5 Claims

1. Process for the separation of 2,4-dinitro-6-t-butyl-3-methylanisole from the crude reaction mixtures obtained by nitrating 6-t-butyl-3 -methylanisole by reaction with a mixture of nitric acid and acetic anhydride wherein water is introduced into the crude reaction mixture in the amount of at least 5% and at most 200% by weight of the nitrating mixture used in the process, in at least two additions, each addition of water

containing no more than 100% by weight of the said nitrating mixture, and prior to each introduction of water, the precipitated product is separated off.

4,233,464

CYCLOHEXENE CAROTINOID INTERMEDIATES

Manfred Baumann, Mannheim, and Werner Hoffmann, Neuhofen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

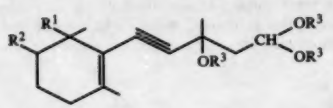
Filed Apr. 12, 1978, Ser. No. 895,629

Claims priority, application Fed. Rep. of Germany, Apr. 20, 1977, 2717502

Int. Cl.³ C07C *43/303*

U.S. Cl. 568—591 **3 Claims**

1. A cyclohexene derivative of the general formula I



I

wherein R^1 and R^2 are hydrogen or methyl, and R^3 is alkyl of 1 to 4 carbon atoms.

4,233,465

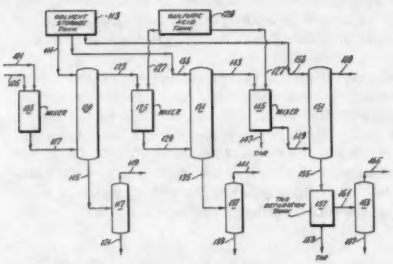
FRACTATION OF OIL OBTAINED BY PYROLYSIS OF LIGNOCELLULOSIC MATERIALS TO RECOVER A PHENOLIC FRACTION FOR USE IN MAKING PHENOL-FORMALDEHYDE RESINS

Robert M. Gallivan, Erie, Pa., and Peter K. Mattschei, Plainsboro, N.J., assignors to American Can Company, Greenwich, Conn.

Division of Ser. No. 918,040, Jun. 22, 1978. This application Nov. 29, 1978, Ser. No. 964,470

Int. Cl.² C07C *37/20, 37/28*

U.S. Cl. 568—727 **13 Claims**



1. A method of recovering a phenolic fraction from distillate oil obtained by pyrolysis of lignocellulosic waste materials, and making phenol-formaldehyde resins therefrom which comprises:

(a) mixing said oil with a base selected from the group consisting of sodium hydroxide, potassium hydroxide and ammonium hydroxide to obtain a mixture having a pH in the range of from about 11 to about 13;

(b) contacting said mixture, in a first extraction zone, with a solvent selected from the group consisting of ether, methylene chloride, chloroform, butanol and hydrocarbons, wherein the volumetric flow rates of the solvent to said mixture is from about 3:1 to about 1:1 to thereby selectively extract the neutral fraction of said oil;

(c) removing a first extract and a first raffinate from said first extraction zone and recovering the neutral fraction from said first extract;

(d) mixing said first raffinate with a mineral acid or carbon dioxide until the pH of said raffinate is lowered to the range of from about 7.5 to about 9.0 and contacting the resulting mixture with said solvent in a second extraction zone, wherein the volumetric flow rates of the solvent to said mixture is from about 3:1 to about 1:1, to thereby selectively extract the phenolic fraction of said oil;

(e) removing a second extract containing said phenolic fraction, and a second raffinate from said second extraction zone,

(f) recovering said phenolic fraction from said second extract, and

(g) reacting said phenolic fraction with formaldehyde in the presence of a metal hydroxide catalyst until the viscosity of the resulting phenol-formaldehyde resin reaches from about 500 cps to about 1000 cps.

4,233,466

HOMOLOGATION PROCESS FOR THE PRODUCTION OF ETHANOL FROM METHANOL

Rocco A. Fiato, Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Filed Nov. 15, 1979, Ser. No. 91,241

Int. Cl.³ C07C *29/32*

U.S. Cl. 568—902 **12 Claims**

1. In a substantially solvent free process of producing ethanol from the reaction of methanol, hydrogen and carbon monoxide wherein the reaction is catalyzed by cobalt, ruthenium, an iodine promoter, and a phosphine ligand of the formula

wherein P is phosphorus and R_1, R_2 and R_3 when taken individually are monovalent alkyl having from 1 to 20 carbon atoms; aryl, aralkyl or alkaryl having from 6 to 10 ring carbon atoms; or cycloalkyl having from 5 to 8 ring carbon atoms; and when any two taken together are a divalent alkylene having from 2 to 6 carbon atoms; the improvement comprising maintaining the phosphine to halide mole ratio at from 1:0.36 to 1:5 while the phosphine to cobalt mole ratio exceeds 1.5:1, whereby the activity, stability and selectivity to ethanol formation of the catalyst are increased.

4,233,467

DEHYDRATION OF α-METHYLBENZYL ALCOHOLS TO FORM MONOVINYLIDENE AROMATIC MONOMERS

Junior J. Lamson, Bay City; Richard H. Hall, Midland; Edward Stroiwas, Merrill, and Larry D. Yats, Clare, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 817,937, Jul. 22, 1977, Pat. No. 4,150,059, which is a continuation-in-part of Ser. No. 601,946, Aug. 4, 1975, Pat. No. 4,049,736, which is a continuation-in-part of Ser. No. 39,889, May 22, 1970, abandoned. This application Mar. 12, 1979, Ser. No. 19,945

The portion of the term of this patent subsequent to Sep. 20, 1994, has been disclaimed.

Int. Cl.² C07C *15/00, 15/10*

U.S. Cl. 585—437 **5 Claims**

1. A process for preparing a monovinylidene aromatic monomer by dehydrating α-methylbenzyl alcohol which comprises a dehydration step of contacting the alcohol in vapor phase with a dehydration catalyst consisting essentially of silica gel in the form of a divided solid having a surface area of at least about 300 m^2/g, said dehydration step being carried out at temperatures from about 200° to about 510° C., and a step of subjecting the product of the dehydration step to simple distillation to obtain styrene in purity greater than 99 mole percent which styrene contains less than 1 mole percent of ethylbenzene impurity.

4,233,468

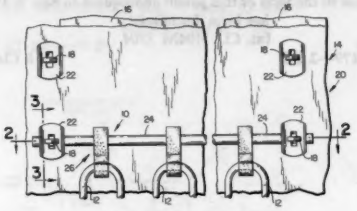
HOLDER ATTACHMENT FOR USE WITH FURNACE HARDWARE

John A. Northup, Jr., 134 Main St., Unionville, Conn. 06085

Filed Dec. 1, 1978, Ser. No. 965,525

Int. Cl.³ H05B *3/66*

U.S. Cl. 13—25 **7 Claims**



1. A holder attachment for a heat containment system having a wall, a plurality of studs attached to the wall and projecting therefrom, at least one layer of lining material impaled on the studs, and a plurality of anchor washers, each of said washers received and retained on an associated one of the studs, the studs and the anchor washers securing said lining material to the wall, said holder attachment comprising a support member having spaced apart holes for receiving associated studs therethrough, said support member adapted to be received on the associated studs between the lining material and the anchor washers on the associated studs, at least one attaching member having means for attaching an article thereto, and means for securing said one attaching member to said support member.

4,233,469

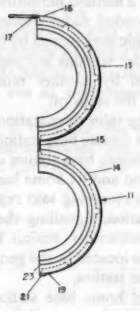
CONDUIT BUSHING

Theodore W. Steppe, P.O. Box 46, Kennedy, N.Y. 14747

Filed Feb. 13, 1979, Ser. No. 12,051

Int. Cl.³ H02G *3/04*; H01B *17/58*

U.S. Cl. 174—83 **1 Claim**



1. A conduit bushing comprising,

an annular, internally threaded member having a first end and a second end,

circumferentially spaced axially extending ribs on the outer periphery of said member,

an outwardly directed flange on said member at said first end thereof extending outward and overlying the ends of said axially extending ribs and integrally attached to said ribs,

an inwardly directed flange on said member at said second end thereof,

said member being divided along a diameter thereof into a first half and a second half,

said first half and said second half each having a first end and a second end,

an integral hinge connecting said first end of said first half to said first end of said second half,

first latch means comprising a strap having an opening therein integrally connected to said second end of said first half end extending therefrom and overlying said second end of said second half,

second latch means comprising a male lug fixed to said second end of said second half,

said opening in said strap being adapted to receive said male lug for holding said first half and said second half together, and

said strap having an outer surface disposed substantially flush with the outer periphery of said outwardly directed flange.

4,233,470

RESTORATIVE MATERIAL FOR ANTIOXIDANT DEPLETED POLYOLEFIN INSULATION

Frederick R. Wight, Jr., West Millington, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jul. 6, 1979, Ser. No. 55,277

Int. Cl.³ H01B *7/28*

U.S. Cl. 174—120 C **8 Claims**

1. A method of protecting polyolefin insulation on an electrical conductor comprising the step of externally applying a protective material to said insulation, with said protective material comprising a stabilizer material that migrates into said insulation, the method characterized in that said stabilizer material comprises a first antioxidant selected from the group consisting of: tetrakis [methylene 3-(3',5'-di-t-butyl-4'-hydroxyphenyl) propionate] methane; thio-diethyl-bis (3,5-di-tert-butyl-4-hydroxy hydrocinnamate); and octadecyl 3-(3',5'-di-tert-butyl-4'-hydroxyphenyl) propionate; and a second antioxidant consisting of: tris (3,5-di-tert-butyl-4-hydroxyphenyl) tricarbonamide; and a peroxide decomposer selected from the group consisting of: tetrakis (nonylphenyl) polypropyleneglycol 425 diphosphite, dilauryl thiodipropionate, and pentaerythritol hexyl thiodipropionate.

4,233,471

AUTOMATIC TELECOMMUNICATION EXCHANGE SYSTEM

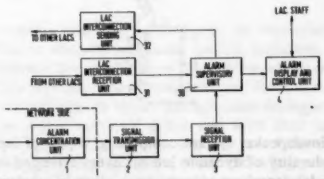
John A. W. Butcher, Stansted, and Michael A. Salino, Hatfield, both of England, assignors to Standard Telephones and Cables Limited, London, England

Filed Dec. 27, 1978, Ser. No. 973,695

Claims priority, application United Kingdom, Jan. 3, 1978, 00040/78

Int. Cl.³ H04B *1/72*; H04J *3/14*

U.S. Cl. 178—69 G **4 Claims**



1. A centralized alarm reporting system for a data handling system having a plurality of nodes, comprising:

a plurality of alarm concentration means, each of said plurality of alarm concentration means having connections to a corresponding one of said nodes for detecting alarm status information of a plurality of points;

a plurality of signal transmission means each comprising first receiving means for receiving said alarm status informa-

tion from a corresponding one of said alarm concentration means, a plurality of first storing means each adapted to store said alarm status information from said plurality of points, means for scanning said plurality of first storing means and for generating message characters, each of said message characters being representations of the alarm status information stored in one of said plurality of first storing means, means for generating information identifying the node providing said received alarm status information, and means for forming messages, each of said messages comprising said identifying information and said characters generated during a scan of said first storage means;

a plurality of signal reception means each adapted for receiving and storing said messages from at least one of said plurality of signal transmission means, said signal reception means comprising receiving means for receiving said messages, first memory means for storing at least a portion of each received message, and means for reading and transmitting information stored in said first memory means in response to a request signal; and

alarm supervisory means including means for generating said request signal and retrieving said information from said signal reception means, second memory means for storing said retrieved information, means for comparing said retrieved information with information stored in said second memory means, and means responsive to said comparing means for amending the contents of said second memory means when said retrieved information is not identical to information stored in said second memory means.

4,233,472

LOUDSPEAKER COMBINATION, COMPRISING A PLURALITY OF DYNAMIC LOUDSPEAKERS, WHICH ARE ARRANGED ADJACENT EACH OTHER IN SUBSTANTIALLY ONE CONTINUOUS PLANE

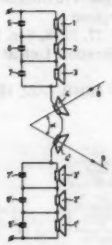
Derk Kleis, Breda, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 13, 1978, Ser. No. 924,361

Claims priority, application Netherlands, Jul. 26, 1977, 7708256

Int. Cl.³ H04R 5/02

U.S. Cl. 179—1 GA **6 Claims**



1. A loudspeaker system comprising, a pair of input terminals, a plurality of dynamic loudspeakers arranged in sections with the loudspeakers adjacent each other in substantially one continuous plane and all sections connected in series across said input terminals, a plurality of capacitors, means connecting a capacitor in shunt with each loudspeaker section but one so as to form respective low-pass filters with the respective impedances of the loudspeaker sections, said low-pass filters having different cut-off frequencies to provide progressive muting of the loudspeaker sections as the frequency increases, and said one loudspeaker section comprises at least two loudspeakers with the axes thereof diverging relative to each other.

4,233,473

COMPREHENSIVE AUTOMATIC MOBILE RADIO TELEPHONE SYSTEM

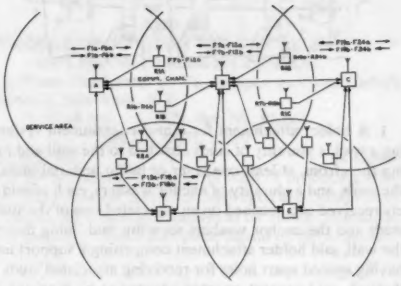
Edward G. Frost, 12000 Old Georgetown Rd., Rockville, Md. 20852

Division of Ser. No. 780,915, Mar. 24, 1977, Pat. No. 4,112,257. This application Aug. 31, 1978, Ser. No. 938,397

The portion of the term of this patent subsequent to Sep. 5, 1995, has been disclaimed.

Int. Cl.³ H04M 7/04

U.S. Cl. 179—2 EB **8 Claims**



1. In a communications system of the type wherein movable subscriber radio receiver stations are capable of receiving coded radio transmissions indicating that a particular subscriber station is being called, wherein each of plural geographically-spaced base stations has a different plurality of subscriber stations assigned thereto and is capable of receiving calls for its assigned subscriber stations from a public telephone system and transmitting said coded radio transmissions for the called subscriber station throughout a geographic area served by that base station, a method permitting subscriber stations to be called via said coded radio transmissions when roaming outside the geographic area served by the home base station to which said subscriber stations are assigned but with a geographic area served by another remote base station, said method comprising the steps of:

(a) upon a roaming subscriber station entering a geographic area served by a remote base station, sending a registration signal to said remote base station identifying the roaming subscriber station and its home base station;

(b) in response to receiving said registration signal at said remote base station, signalling the home base station of said roaming subscriber station that the roaming subscriber station is located in the geographic area served by said remote base station;

(c) storing at said home base station, in response to said signalling from said remote base station, location data indicating that said roaming subscriber station is located in said geographic area served by said remote base station;

(d) in response to receiving a call at said home base station for said roaming subscriber station, determining from said stored location data the geographic area in which said roaming subscriber station is located and transferring said call to said remote base station serving the determined geographic area; and

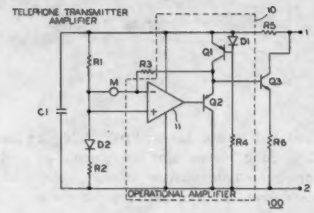
(e) at said remote base station, in response to transfer of a call thereto for said roaming subscriber station, transmitting said coded radio transmissions for said roaming subscriber station throughout the geographic area served by said remote base station.

4,233,474

TELEPHONE TRANSMITTER AMPLIFIER

Esao Hishinuma; Akinobu Tomimori, and Hiroshi Hara, all of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Jan. 5, 1979, Ser. No. 1,361
Claims priority, application Japan, Jan. 10, 1978, 53-1757; Jan. 10, 1978, 53-1758; Feb. 1, 1978, 53-10957
Int. Cl.³ H04M *1/60*
U.S. Cl. 179—81 B 9 Claims



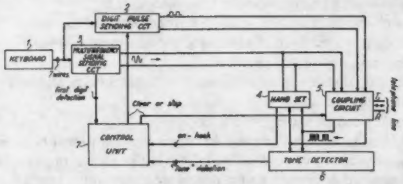
1. A telephone transmitter amplifier comprising a microphone means, an operational amplifier means including a differential amplifier, said microphone means being coupled to an input of said differential amplifier, a grounded collector PNP (or NPN) transistor connected to the output terminal of said differential amplifier and a first constant-current circuit means connected to the emitter of said PNP (or NPN) transistor, an output stage amplifier including a grounded emitter NPN (or PNP) transistor circuit having its base directly connected to the output terminal of said operational amplifier, a smoothing circuit means for smoothing a voltage supplied from a telephone line, and a voltage-divider circuit means for dividing the output voltage of said smoothing circuit to establish preset operating points for said operational amplifier and said output stage amplifier, output terminals of said output stage amplifier being connected in common to input terminals of said smoothing circuit means.

4,233,475

TELEPHONE STATION WITH AUTOMATIC SWITCH-OVER BETWEEN PULSE CODE DIALLING AND MULTIFREQUENCY CODE DIALLING

Bernard G. Roche, 13, rue de Bourgogne, (22300) Lannion, France

Filed Mar. 5, 1979, Ser. No. 17,335
Claims priority, application France, Mar. 8, 1978, 78 06683
Int. Cl.³ H04M *1/50*
U.S. Cl. 179—84 VF 6 Claims



1. A telephone station connected to a telephone network by a telephone subscriber's line adapted for automatic switching between pulse code dialling and frequency code dialling comprising:

a keyboard with a plurality of keys;

means controlled by said keyboard for generating call digit pulse trains which are associated with the keyboard keys respectively;

means controlled by said keyboard for generating call digit multifrequency signals which are associated with said keyboard keys respectively;

an audio circuit for said telephone station;

a coupling circuit for connecting said generating means and the telephone station audio-circuit to said telephone line;

means for blocking pulse train transmission from said pulse train generating means and simultaneously releasing multifrequency signal transmission from said multifrequency signal generating means or vice versa;

said telephone network including supervisory signal generating means;

means for detecting supervisory signals which are transmitted from said telephone network and which indicate start the of various call phases in setting up a telephone communication;

said detecting means controlling said blocking and releasing means in response to detection of each of said supervisory signals so that only said multifrequency signal generating means transmits over said telephone line only the multifrequency signal associated with the first key of a dialling call pulse whose beginning is indicated by the detection of a corresponding supervisory signal; and

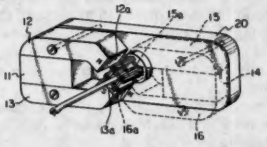
said detecting means thereafter controlling said blocking and releasing means in response to further detection of said corresponding supervisory signal, so that only said pulse train generating means transmits over said telephone lint the pulse train associated with said first key and then said pulse trains associated with the subsequent keys of said call dialling pulses and in response to the non-detection of said corresponding supervisory signal so that only said multifrequency signal generating means transmits over said telephone line said multifrequency signals associated only with said subsequent keys.

4,233,476

MOVING COIL TYPE CARTRIDGE

Isamu Ikeda, 3-17, Oyamadai 1-chome, Setagaya-ku, Tokyo, Japan

Filed Jan. 2, 1979, Ser. No. 4
Claims priority, application Japan, Mar. 27, 1978, 53-35127
Int. Cl.³ H04R *9/16*
U.S. Cl. 179—100.41 D 3 Claims



1. In a moving coil type of cartridge for reproduction of sound on stereo discs in which the groove undulates in two lateral directions, the combination comprising a base member, magnetic means on the base member defining four substantially flat pole faces arranged in square configuration facing mutually inwardly to define a central space and with their adjacent edges slightly spaced from one another, the pole faces comprising first and second opposed pairs, means including permanent magnets for magnetizing the first and second pairs of pole faces so that the opposed pole faces are of the same polarity and so that adjacent pole faces are of opposite polarity with the lines of flux flowing through the pole faces from one pole face to the next being generally perpendicular to the face, a first coil in the central space having its axis parallel to the first pair of pole faces and having the turns thereof spaced along and lying closely adjacent such pole faces for acting upon by the flux flowing therethrough, a second coil in the central space having its axis parallel to the second pair of pole faces and having the turns thereof spaced along and lying closely adjacent such pole

faces for acting upon by the flux flowing therethrough, the axes of the coils being at right angles to one another and the coils being physically coupled so that they together substantially form a square prism, a shank of non-magnetic material arranged along a central axis which is substantially perpendicular to both of the coil axes, the coils being secured to the shank, a stylus at the end of the shank for engaging the groove in the disc, and means for resiliently supporting the shank on the base member so that movements of the stylus in the two lateral directions cause axial movements of the coils in respective directions for cutting of the lines of flux at the respective pairs of pole pieces with the result that the coils produce respective output voltage waves representative of the undulations of the groove.

4,233,477

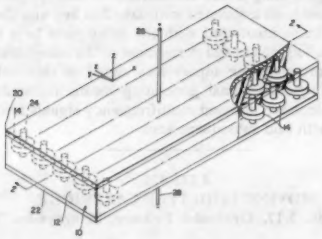
FLEXIBLE, SHAPEABLE, COMPOSITE ACOUSTIC TRANSDUCER

Roy W. Rice, Alexandria, and Robert C. Pohanka, Springfield, both of Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 31, 1979, Ser. No. 8,028

Int. Cl.³ H01L *41/10*; H04R *17/00*

U.S. Cl. 179—110 A **9 Claims**



1. A flexible, shapeable, composite acoustic transducer which comprises:

a flexible polymer;

a plurality of polarized and electroded electroacoustic wafers assembled within said polymer in an x-y plane,

each of said wafers being oriented with its line of polarization in the same direction as those of the others and all having their positive poles on the same side of the x-y plane;

electrically conductive foils on opposite surfaces of said polymer;

means providing a conductive path between opposite faces of each of said electroacoustic wafers and each of said conductive foils; and

electrical leads electrically secured to each of said foils for conducting an electrical signal to or from said wafers.

4,233,478

CIRCUIT TRANSFER APPARATUS

John M. Stahl, Downers Grove, and Robert W. DeRoss, Cicero, both of Ill., assignors to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Aug. 12, 1977, Ser. No. 823,921

Int. Cl.² H01R *33/30*; H05B *9/06*

U.S. Cl. 200—51.09 **20 Claims**

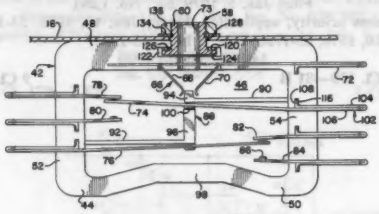
1. A jack for regulating the time and temperature responsive control circuits of a microwave oven, comprising:

housing means including an orifice for receiving a temperature probe plug therein;

temperature-sensing circuit contact means for electrically engaging said plug within said housing means;

time and temperature responsive control circuit contact means including a plurality of first and second contact members disposed within said housing means, said first contact members being electrically engageable with selected second contact members; and

means for electrically isolating said first contact members from one another and including means for translating the



insertion and withdrawal movements of said plug into and from said housing means into movements of said first contact members to selectively engage various second contact members to transfer between the control circuits of the oven.

4,233,479

SWITCH

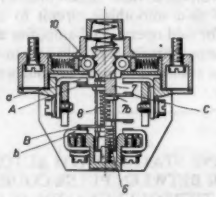
Wolfgang Karpe; Johannes Kluge, both of Wetter, and Klaus-Dieter Oemus, Hemer, all of Fed. Rep. of Germany, assignors to Mannesmann Demag AG, Fed. Rep. of Germany

Filed Apr. 2, 1979, Ser. No. 25,933

Claims priority, application Fed. Rep. of Germany, Apr. 10, 1978, 2815493

Int. Cl.³ H01H *15/18, 3/12, 13/04*

U.S. Cl. 200—77 **8 Claims**



1. A stepped push button switch, comprising

(a) a housing body;

(b) a switch contact carrier displaceable in said body;

(c) a push button engaging said carrier;

(d) return spring means for maintaining said carrier in off position; the improvement characterized by

(e) a plurality of axially spaced notches on said carrier;

(f) spring biased lock-in elements for engaging sequentially said notches on said carrier;

(g) an initial stress spring disposed between said push button and said carrier;

(h) a top cover plate for said body;

(i) a bore in said cover plate for receiving said push button;

(j) opposed grooves in said body at right angles to the axis of said contact carrier and on eacn side thereof;

(k) a U-shaped guide disposed in each said groove;

(l) the legs of each U-shaped guide forming slots for receiving said lock-in elements;

(m) the springs of said lock-in elements received in said U-shaped guides;

(n) a thrust bearing disposed between each said lock-in element and its respective spring; and

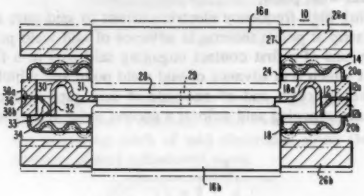
(o) pegs disposed on each said thrust bearing and the opposed wall of each said groove for receiving each end of the said springs of said lock-in elements.

4,233,480

LOW VOLTAGE VACUUM SWITCH WITH THREE INTERNAL CONTACTS INCLUDING A CENTER FLOATING CONTACT

Robert M. Hruda, Horseheads, N.Y., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 20, 1978, Ser. No. 944,092
Int. Cl.³ H01H *33/66*
U.S. Cl. 200—144 B **8 Claims**



1. A direct current, low voltage vacuum switch which is operable to carry a high continuous current of several thousand amperes and to interrupt this arc current formed when the switch contacts are opened at a low dc voltage across the switch which extends the arc voltage above which the arc current would normally be sustained in vacuum between a single pair of spaced apart contacts, which switch comprises a hermetically sealed envelope having a central annular insulating portion, opposed thin flexible corrugated annular members extending inward from the central annular insulating portion in a direction transverse to the axis of the central annular insulating portion, movable high current carrying cylindrical conductive end contacts sealed to the inner annular edge of the thin flexible corrugated annular members, the improvement wherein a center contact is disposed within the hermetically sealed envelope between the opposed end contacts which are axially movable to and from contact with the center contact, which center contact is supported from the central annular insulating portion and electrically isolated from the opposed cylindrical end contacts in the open switch position where the end contacts are moved in opposed axial directions, and wherein the center contact is supported from the annular insulating portion by a central arc shield member disposed about the arc paths between the contacts and the annular insulating portion, with a thermally expansive support means connected between the annular insulating switch portion and the central arc shield member.

4,233,481

MECHANICAL TRANSFER SWITCH

Jack L. Kruger, P.O. Box 215, Goffstown, N.H. 03045

Filed Mar. 29, 1979, Ser. No. 25,275
Int. Cl.² H01H *3/00*
U.S. Cl. 200—153 D **14 Claims**

1. A switch for use in R F transmission, said switch comprising

a first supporting plate,

a shaft extending through said first plate and mounted thereon for rotative and axial movement,

a handle fixed to said shaft on one side of said plate,

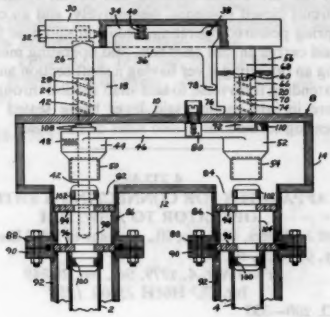
a rigid conductive bar associated with said shaft on the other side of said plate whereby movement of said handle will cause corresponding movement of said bar,

spaced electrical connectors on said bar,

a second supporting plate fixedly spaced from said first plate,

a plurality of cooperating electrical terminals mounted on said second plate and electrically insulated therefrom,

said cooperating terminals located on said second plate to receive said bar connectors when said connectors are first aligned with said terminals by suitable rotation of said handle and said connectors are than caused to engage said terminals by movement of said handle toward said first plate, whereby the circuit between a selected pair of terminals can be closed and



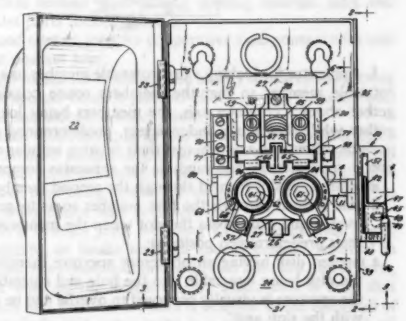
means for preventing movement of said bar and connectors toward said second plate except when the bar connectors are aligned with two of said cooperating terminals.

4,233,482

ENCLOSED FUSED DISCONNECT SWITCH

Bernard DiMarco; Ralph C. Clement, and Charles W. Parmenter, all of Bellefontaine, Ohio, assignors to Gould Inc., Rolling Meadows, Ill.

Filed Feb. 28, 1977, Ser. No. 772,441
Int. Cl.³ H01H *1/42*
U.S. Cl. 200—163 **15 Claims**



1. Electric switch apparatus, comprising:

an insulating base, said insulating base including a front and a back connected by opposite first and second sides and opposed first and second ends; confronting closely-spaced, generally parallel first and second stationary contact jaws, a U-shaped movable contact including, in cross-section, relatively long first and second arms connected at their first ends by a relatively short web and extending rearward from the latter, an insulating carrier to which said movable contact is mounted, said carrier being movable between circuit opened and circuit closed positions; in said circuit closed position said movable contact being disposed in the space between said jaws with said first and second arms in engagement with the respective first and second jaws; in said circuit opened position said movable contact disengaged from said jaws; said contact jaws having the surfaces thereof, opposite those surfaces engaged by the contact arms, disposed adjacent to surfaces of said base; a line terminal at said first end and a load terminal at said second end, circuit means connected between said terminals, said circuit means including said

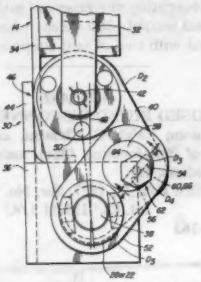
movable contact and said jaws, said base also including guide channels wherein said carrier is mounted for front to rear movement between said circuit opened and said circuit closed positions, respectively, and an over-center spring powered operating means on said base for moving said carrier in said channels, said operating means including an operating lever having a shaft section and a tongue extending transverse to said shaft section through an aperture in said carrier, said lever being seated in aligned bearing formations in said sides of said base.

4,233,483

APPARATUS FOR CONNECTING A SWITCH OPERATOR TO A SWITCH

Edward J. Rogers, Chicago, Ill., assignor to S&C Electric Company, Chicago, Ill.

Filed Apr. 4, 1979, Ser. No. 26,849
Int. Cl.³ H01H *25/00, 1/50*
U.S. Cl. 200—337 **9 Claims**



1. Apparatus for locking a first rotatable member to a second rotatable member so that the members rotate coaxially together about a common axis, the members being locked together while they are in independent, predetermined angular positions about the axis whereat their relative angular orientation is unpredictable and random; the apparatus comprising:

an elongated slot formed through the second member;

a hole formed through the first member so as to generally overlie and encompass the slot when the members are in their predetermined positions;

a tapered disk having an off-center aperture therethrough, the disk being insertable into the hole and rotatable until the aperture is visually observed to overlie and be aligned with the slot; and

connecting means insertable through the aligned aperture and slot for pulling the first member and the disk toward the second member to lock the members together so that they are coaxially rotatable together and to jam the disk into the hole to prevent rotation therein.

4,233,484

HIGH FREQUENCY CURRENT WELDING OF METAL STRIP TO A METAL PART

Humfrey N. Udall, Darien, Conn., assignor to Thermatool Corp., Stamford, Conn.

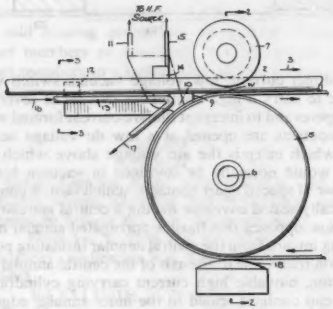
Filed Dec. 7, 1978, Ser. No. 967,112
Int. Cl.³ B23K *31/06*
U.S. Cl. 219—67 **19 Claims**

1. A method for welding a thin, flexible, metal strip to a metal part along a line extending longitudinally of the strip using high frequency electric current to heat the surfaces of the part and the strip to be joined to welding temperature, said strip having a face between its longitudinal edges which is large in width relative to its thickness and having a thickness which permits it to undulate in a direction perpendicular to said face in the absence of support therefor, and said part having a longitudinal surface portion which is narrower than said face, said method comprising:

continuously advancing said metal part toward a weld point;

continuously advancing said strip toward said weld point and into contact with said part at said weld point and with said face thereof facing said portion of said part and, in advance of said weld point, maintaining the strip spaced from said part so that a narrow V-shaped gap is present between said strip and said portion of said part in advance of said weld point;

supplying high frequency electric current to said part and said strip at points thereon in advance of said weld point by means of a first contact engaging said part at a first point which is in advance of said weld point and which is at the upstream end of one side of said gap, a second contact engaging said strip at a second point which is in



advance of said weld point and which is at the upstream end of the other side of said gap to heat the portions of the surfaces of the strip and the part which are nearest each other to welding temperature by the time they reach said weld point;

constraining said strip to a fixed path which is said other side of said V-shaped gap from said second point to said weld point by engaging said strip from said second point to adjacent said weld point and at the side thereof opposite to said face with a rigid member having the path shape of said other side of V-shaped gap and applying a force to said strip directed so as to maintain said strip against said member and to substantially prevent movement of said strip toward or away from said metal part during its passage from said second point to said weld point; and

pressing said strip and said portion of said part together at said weld point to form a weld therebetween.

4,233,485

PROCESS FOR ELECTRICAL DISCHARGE MACHINING OF CYLINDRICAL WORK

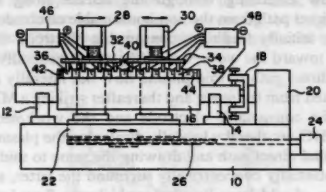
Kunihiko Sato, Owari-Asahi; Tetsuro Urata; Tetsuhiro Asamoto, both of Nagoya; Kobun Asakawa, Fukuyama; Takeo Uebayashi, Fukuyama, and Mitugi Kawano, Fukuyama, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha and Nippon Kokan Kabushiki Kaisha, both of Tokyo, Japan

Filed Jun. 30, 1978, Ser. No. 920,989
Int. Cl.³ B23P *1/12*
U.S. Cl. 219—69 M **5 Claims**

1. In an electrical discharge machining process for giving a satiny finish to the outer surface of a cylindrical work, wherein a plurality of head columns is disposed with a predetermined interval between adjacent head columns, each of said head columns having mounted thereon a plurality of electrodes arranged at an equal pitch to face the cylindrical work rotated at a constant speed, the improvement comprising the steps of:

controlling the feeding of said electrodes toward the work-

ing surface of said cylindrical work separately for each of the head columns; and



reciprocally and continuously feeding said head columns transversely at a constant speed over a distance equal to the mounting pitch of said electrodes along the axis of rotation of said cylindrical work.

4,233,486

TRAVELING-WIRE ELECTRICAL DISCHARGE MACHINE

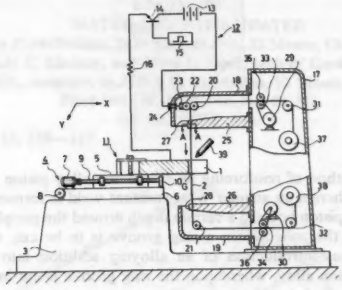
Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Yokohamashi, Japan

Filed Dec. 21, 1978, Ser. No. 971,820

Claims priority, application Japan, Dec. 26, 1977, 52-155676; Jan. 5, 1978, 53-30

Int. Cl.³ B23P *1/08*

U.S. Cl. 219—69 W **5 Claims**



1. A traveling-wire electrical discharge machine for electroerosively machining a workpiece located in a machining region with a condinuous elongate electrode, said machine comprising: a single column mounted on a machine base; supply reel means mounted on said column for feeding said continuous elongate electrode; takeup reel means mounted on said column for collecting said continuous elongate electrode; a pair of first arms individually mounted to said column and supporting at their respective end portions a pair of first guide sections for spanning said continuous elongate electrode therebetween across said machining region and for guiding said continuous electrode from said supply reel means toward said machining region and for guiding said spanned electrode toward said takeup reel, respectively;

means for advancing said continuous electrode and transporting it through said machining region; a pair of second arms mounted individually to said column and supported independently of said first arms by said single column between said first arms and supporting at their respective end portions a pair of second wire guide sections spacedly positioned between said first wire guide sections across said machining region for guiding said spanned electrode precisely in line with a cutting section across a machining gap in said machining region.

4,233,487

METAL BUILD-UP APPARATUS WITH IMPROVED COOLING MEANS

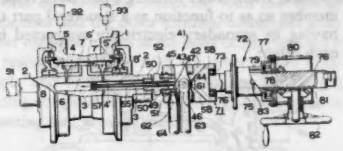
Yasumitsu Moriki; Izumi Takahashi; Masahiro Sakurai, and Hidehiro Shimizo, all of Tokyo, Japan, assignors to Maruma Jyusharyo Kabushikigaisha, Tokyo, Japan

Filed Oct. 5, 1978, Ser. No. 948,840

Claims priority, application Japan, Jun. 23, 1978, 53/87268[U]

Int. Cl.³ B23K *9/32*

U.S. Cl. 219—76.11 **2 Claims**



1. A cooling apparatus in a re-building welding machine for track rollers, said apparatus comprising:

a track roller shaft,

a lubrication oil passage bore extending axially in said shaft and opening at one end thereof,

said track roller shaft further comprising axially spaced, radial oil passage branch bores opening to said axial bore, and being in fluid communication with the track roller at their radial outboard ends,

a first contact joint,

means for coupling said first contact joint to the open end of said track roller shaft,

said first contact joint having cooling medium inlet and outlet ports formed therein;

a second contact joint for cooperative axial contact with said first contact joint;

plunger means for rotatably and axially movably supporting said second contact joint to effect contact between said first and second contact joints;

an intake tube having at its end a valve body sealably fitted to the inner surface of said oil passage bore when said first contact joint is coupled to the open end of said shaft, said intake tube being connected to said first contact joint in communication with said inlet port;

said first contact joint including an intake/exhaust sleeve including an intake terminal and an exhaust terminal in respective communication with said inlet and outlet ports, and wherein the length of said intake tube is such that when said first contact joint is coupled to the open end of said shaft, said valve body is positioned within said oil passage bore between said radial oil passage branch bores; whereby cooling medium may be fed through said intake terminal by means of said intake/exhaust sleeve and circulated through said track roller for cooling of said track roller during welding rebuilding.

4,233,488

DEEP THROAT RESISTANCE WELDER

Charles A. Schwartz, 24545 Bryden, Beachwood, Ohio 44122

Filed Nov. 23, 1977, Ser. No. 854,333

Int. Cl.³ B23K *9/28, 11/24*

U.S. Cl. 219—89 **6 Claims**

1. An electrical, resistance-type welding machine comprising, a generally U-shaped body having an upper elongated body member, a lower elongated body member in transversely spaced-apart relationship to said upper body member, and an intermediate elongated body member in electrical communication intermediate said upper and lower body members, said upper, lower and intermediate body members formed as a unitary, physically U-shaped integral structure; each of said body members having a first end and a second end;

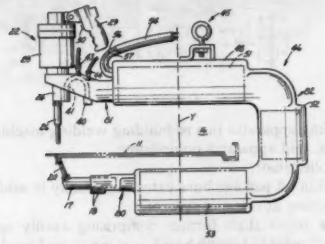
a first electrode near said first end of said upper body member;

a second electrode near said first end of said lower body member,

said first and second electrodes being oppositely disposed relative to one another for welding;

each body member comprising at least one linear tranformer each such linear transformer having an elongated digitated secondary with terminals near the ends thereof and, associated with said secondary, a primary coil having a predetermined multiplicity of turns;

each linear transformer forming a part of its respective body member so as to function as a structural part thereof and having its secondary electrically connected in series to each other;



the primary coil of each linear transformer positioned adjacent to its respective digitated secondary;

cooling passages within each said secondary and within each of said body members, said passages being sealingly connected in open fluid communication with each other to provide a cooling path for coolant;

said linear transformers together comprising at least 20 percent of the curvilinear length of said U-shaped body;

movement means to effect movement of said first and second electrodes relative to one another; and

power supply means remoté from said welding machine including electrical conductor means for supplying power from said power supply means to each of said linear transformers.

4,233,489

METHOD OF AND DEVICE FOR PLASMA MIG-WELDING

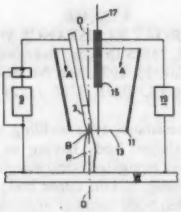
Wilhelmus G. Essers, Emmasingel, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 558,018, Mar. 13, 1975, abandoned. This application Apr. 10, 1978, Ser. No. 894,756

Claims priority, application Netherlands, Mar. 25, 1974, 7403866

Int. Cl.[2] B23K *9/00*

U.S. Cl. 219—121 P **2 Claims**



1. A method of plasma-MIG welding, which comprises flowing a thermally ionizable gas past a non-consumable electrode through a non-constricting nozzle toward a workpiece; initially establishing a plasma arc between said non-consumable electrode and said workpiece to initiate and sustain a plasma flow extending through the nozzle along a non-deviated direct path from the non-consumable electrode to the workpiece; initially feeding a consumable electrode through the nozzle toward the workpiece along a path generally parallel to the direct path of said plasma flow but laterally spaced and separated from the same; and thereafter striking a MIG-arc between the consumable electrode and the workpiece, the resulting MIG-arc thereby laterally displaying the plasma flow from its initial direct path and drawing the same to said MIG-arc to substantially concentrically surround the latter, a slight constriction of said laterally displaced plasma flow being simultaneously effected by said MIG-arc, said slight constriction being caused solely by said MIG-arc.

4,233,490

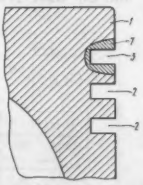
METHOD OF REINFORCING ALUMINIUM ALLOY PISTON RING GROOVE

Alexandr N. Shalai, ulitsa Budapeshtskaya, 98, korpus, 3, kv. 88; Mikhail D. Nikitin, Novoizmailovsky prospekt, 27, kv. 52; Nikolai I. Zakharov, ulitsa Avtovskaya, 2, kv. 112, all of Leningrad, and Anatoly P. Bratchenko, ulitsa Kievskaya, 3b, kv. 39, Michurinsk Tambovskoi oblasti, all of U.S.S.R.

Filed Jun. 20, 1979, Ser. No. 50,468

Int. Cl.[3] B23K *9/00;* **B23P** *15/10*

U.S. Cl. 219—121 P **7 Claims**



1. A method of reinforcing an aluminium alloy piston ring groove, wherein an annular wear-resistant weld is formed by fusing the piston body to a certain depth around the periphery thereof in the zone where a ring groove is to be cut, with simultaneous introduction of an alloying addition into the molten piston alloy, whereupon the ring groove is cut in the periphery of said weld.

4,233,491

METHOD AND APPARATUS FOR CONTROLLING INCREMENT TYPE POSITION CONTROL APPARATUS

Shigeo Maruyama; Yuji Nishikaichi; Shigeki Fujinaga, and Tatsuya Miura, all of Nishinomiya, Japan, assignors to Shin Meiwa Industry Co., Ltd., Nishinomiya, Japan

Filed Jun. 26, 1978, Ser. No. 919,174

Int. Cl.[3] B23K *9/12;* **G05B** *19/00*

U.S. Cl. 219—125.1 **39 Claims**

12. An incremental type position control apparatus for controlling the position of an object being controlled through comparison of data concerning the present position of the object being controlled and data concerning a next commanded position, comprising:

means for providing a command signal for calibrating data concerning an origin position;

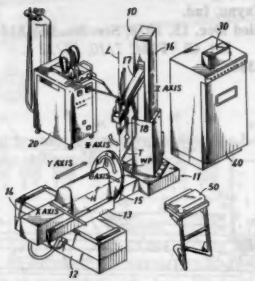
displacement means responsive to said command signal, for controllably displacing the object being controlled in a direction toward the origin position so as to pass said origin position;

means for stopping the object being controlled when the object being controlled passes said origin position;

said displacement means being responsive to said stopping and said displacement means displacing the object being

controlled so as to pass said origin position for a second time; and

means for resetting the data concerning the present position of the object being controlled to an initial condition in dependence upon the data concerning the origin position when the object being controlled passes said origin position for the second time.



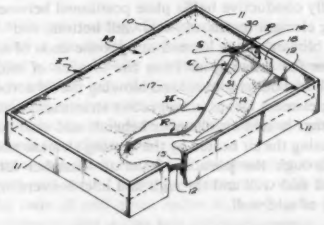
15. An incremental type position control apparatus in accordance with claim 12, wherein said position control apparatus comprises an automatic welding apparatus, comprising a welding torch and a workpiece, and wherein the object being controlled comprises at least one of said welding torch and workpiece.

4,233,492

WATER BED WITH HEATER

James P. McMullan, 2630 Seaman Ave., El Monte, Calif. 91733; Rudy E. Lindsay, and Jerry E. Land, both of Garden Grove, Calif., assignors to James P. McMullan, El Monte, Calif.

Filed Oct. 19, 1979, Ser. No. 86,281
Int. Cl.[3] H05B *3/00*
U.S. Cl. 219—217 9 Claims



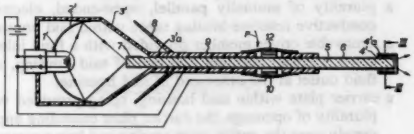
1. In combination, a flotation mattress for water beds comprising a water-proof bladder of flexible plastic sheet material having flat, horizontal top and bottom walls, vertical side and end walls and an elongate tubular filler neck with an inner end fixedly related with an opening in one wall of the mattress and extendable outwardly therefrom and having an open outer end, a volume of water within and slackily filling the mattress, an elongate flexible electric heater with an elongate flexible power supply section with a pair of longitudinally extending electrically insulated power lines and having inside and outside portions, said outside portion having an outer free end connected with an electric power supply, a filler neck engaging plug on the power section between the inside and outside portions thereof and engaged in the outer open end portion of the stem with said inside portion extending longitudinally through the stem and into the mattress, an elongate temperature responsive control section with inner and outer ends, means sealingly coupling the outer end of the control section with the inner end of said inside portion and positioned in the water within the mattress, an elongate flexible electric heater section with inner and outer ends positioned within and extending about the interior of the mattress and within the water therein, said heater section has an elongate electrically insulated resistance element extending longitudinally from its outer end to its inner end and thence to its outer end, means sealingly coupling the inner end of the control section with the outer end of the heater section, said control section including an elongate tubular metal heat conducting body normally in heat conducting contact with the water in the mattress, a normally closed temperature responsive switching device with a pair of terminals positioned within the body in heat conducting contact therewith with one terminal connected with one end of the resistance element and the other terminal connected with one of said power lines and means in the body connecting the other end of the resistance element with the other power lines said power supply and heater sections including flexible ground lines extending longitudinally therethrough and means in the body connecting said ground lines.

4,233,493

APPARATUS FOR APPLYING INTENSE LIGHT RADIATION TO A LIMITED AREA

Günther Nath, 21 Speyererstrasse, Munich, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 578,416, May 19, 1975, abandoned. This application Dec. 9, 1977, Ser. No. 859,143
Claims priority, application Fed. Rep. of Germany, May 21, 1974, 2424726; Mar. 13, 1975, 2511037
Int. Cl.[3] H05B *3/02*; A61N *5/06*; F21V *9/00*
U.S. Cl. 219—354 36 Claims



1. Apparatus for applying intense light radiation to a limited area, particularly blood or tissue coagulation apparatus for application to living tissue by direct contact of the apparatus therewith, said apparatus comprising

an incandescent lamp emitting intense radiation high in infrared content and forming a light radiation source;

a housing enclosing said light source;

means defining a light exit surface on said housing from which the radiation produced by said source emerges;

a light guide means associated with said housing in light-conducting relation to said source and providing said means defining said light exit surface;

and an application element having a surface for directly contacting said tissue and consisting of a material transparent to infrared radiation emitted by said source; said contacting surface of said application element being formed by a polymeric material consisting essentially of carbon and fluorine; of Teflon ETFE, Teflon PFA, Teflon FEP, Teflon PTFE; or a polymer comprising as main constituents carbon, fluorine and hydrogen,

said application element being applied to said light guide means with said contacting surface covering said light exit surface thereby permitting direct application of the radiation from said source through the light guide means and the application element to the tissue, the contacting surface portion of said application element covering said exit surface and adapted to contact the tissue being at least 0.1 mm in thickness and being essentially stiff and non-pliable.

4,233,494

THROUGHFLOW ELECTRIC HEATER FOR FLUIDS SUCH AS AIR

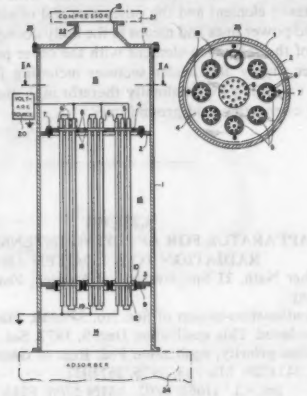
Rudolf Pawlik, Wofratshausen, and Walter Fierlbeck, Munich, both of Fed. Rep. of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Jul. 11, 1978, Ser. No. 923,672

Claims priority, application Fed. Rep. of Germany, Jul. 15, 1977, 2732133

Int. Cl.³ H05B *3/02*; F24H *3/04*

U.S. Cl. 219—382 **2 Claims**



1. An electrical fluid heater comprising:

a cylindrical housing;

a plurality of mutually parallel, open-ended, electrically conductive resistive-heating tubes within said housing;

a removable cover member provided with a fluid inlet, the cover member forming one end of said housing, and a fluid outlet at the other end of said housing;

a carrier plate within said housing, being provided with a plurality of openings, the carrier plate extending approximately over the entire cross section and being removably and in an essentially fluid-tight way mounted to the inner wall of the housing, thereby defining a first or antechamber with said cover member and the inner wall of said housing at said one end;

a plurality of holder plates equal in number with said openings in said carrier plate, each opening receiving in an easily removable and nearly fluid-tight manner one holder plate, each holder plate being formed from an electrically nonconductive refractory material and provided with a number of bores each receiving in a tight-fitting manner one of said tubes, the tubes received by the bores of one holder plate forming a group, the totality of groups constituting said plurality of tubes;

a support plate within said housing provided with openings equal in number with the openings in said carrier plate, the support plate being mounted in a nearly fluid-tight manner to the inner wall of said housing, thereby defining a second or buffer chamber with the carrier plate and the inner wall of the intermediate portion of said housing and a third or exit chamber with the inner wall of said other end of said housing, each opening of the support plate receiving one of said groups of tubes, each group being engaged in an electrically insulating heat-resistant spacer arranged within the respective opening of the support plate;

a flow path for the fluid to be heated defined by said fluid inlet, said antechamber, said tubes, said exit chamber and said fluid outlet, the tubes extending from the antechamber through said holder plates, said buffer chamber and the openings in said support plate to the exit chamber;

a voltage source connected across the tubes; and

a fluid source communicating with said fluid inlet for introducing thereinto a stream of fluid to be heated by said tubes upon passing therethrough to said fluid outlet.

4,233,495

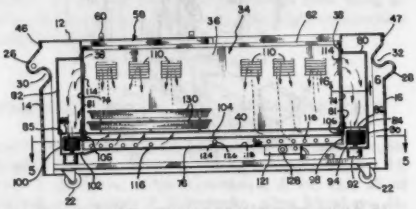
FOOD WARMING CABINET

John R. Scoville, Butler, and Richard W. Gigandet, Fort Wayne, both of Ind., assignors to Lincoln Manufacturing Company, Inc., Fort Wayne, Ind.

Filed Dec. 15, 1978, Ser. No. 969,814

Int. Cl.³ F24C *7/10, 15/32*

U.S. Cl. 219—386 **11 Claims**



1. A food warming cabinet comprising:

an upwardly opening well having a pair of side walls, a pair of end walls and a bottom,

a housing connected to said well and surrounding the well on the sides, ends and bottom thereof and being spaced from the well so as to form a substantially enclosed air chamber immediately adjacent the side and end walls and the bottom of said well,

a plurality of inlet louvers in one of said pair of walls and a plurality of outlet louvers in the other of said pair of walls providing communication between said air chamber and the interior of said well,

heating element means within said air chamber positioned beneath said well bottom so as to radiate heat upwardly to said well bottom,

a thermally conductive baffle plate positioned between said heating element means and said well bottom, and

a pair of blower means located at opposite ends of said air chamber for drawing air from the interior of said well through said outlet louvers and blowing the air across said heating element means in respective streams inpinging on each other in said air chamber beneath said well bottom, and causing the air heated by the heating element means to flow through the portion of the air chamber laterally adjacent said well and through said inlet louvers into the interior of said well.

4,233,496

APPARATUS FOR REMOVAL OF RESIDUES BY MEANS OF PYROLYSIS

Werner Weber, Emmenbrucke, and Hubert Rustler, Lucerne, both of Switzerland, assignors to Viscosuisse S.A., Emmenbrucke, Switzerland

Filed Jun. 28, 1978, Ser. No. 919,895

Claims priority, application Switzerland, Aug. 12, 1977, 9891/77

Int. Cl.³ H05B *1/00*

U.S. Cl. 219—390 **5 Claims**

1. An apparatus for the removal by means of pyrolysis of residues from equipment used in polymerization and treatment of synthetic materials, comprising a slightly inclined substantially horizontal tubular heating chamber means for sealing against the introduction of gases, including a drain and collecting receptacle at the lower lying end of the heating chamber for collecting melted effluent residues, an outlet vent for removing distilled gases from the heating chamber, means associ-

ated with said outlet vent for burning the distilled gases, a valve-controlled air inlet at the higher end of the heating

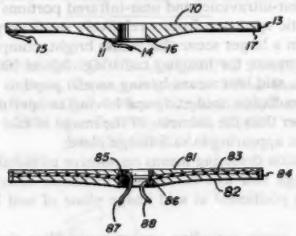
chamber, and heating means surrounding the heating chamber for controlling the temperature therein.

4,233,497

ELECTRIC HEATING ELEMENT

Herman H. Lowell, 2808 Harris Ave., Wheaton, Md. 20902

Filed Dec. 4, 1978, Ser. No. 966,214
Int. Cl.³ H05B *3/00*
U.S. Cl. 219—468 **19 Claims**



1. An electric heating element, comprising:
a resistive electrical conductor geometrically configured about a central point and having uniform resistivity;
said conductor including radial dimensions in a first plane including said central point;
said conductor including a varying thickness perpendicular to said first plane; and
wherein said thickness of said conductor at a given radius from said central point varies inversely with the square of the ratio of said given radius to a reference radius, at a reference point within said radial dimensions of said conductor.

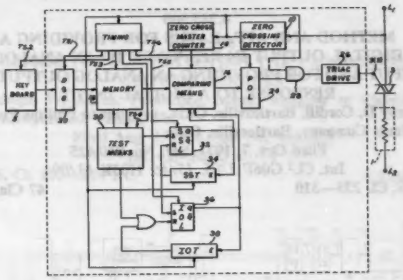
4,233,498

POWER CONTROL FOR APPLIANCE USING HIGH INRUSH CURRENT ELEMENT

Thomas R. Payne, Louisville, Ky., and Alfred L. Baker, Longmount, Colo., assignors to General Electric Company, Louisville, Ky.

Filed Feb. 1, 1979, Ser. No. 8,356
Int. Cl.³ H05B *1/02, 3/68*
U.S. Cl. 219—490 **27 Claims**

1. A heating apparatus comprising a heating element, power control means having a plurality of operator selectable power level settings including an OFF setting for controlling the power output of said element, said element characterized by a relatively fast thermal response whereby application of power thereto at a predetermined level results in an almost immediate visible glow from said element, and means for applying power to said element at said predetermined level for a preselected



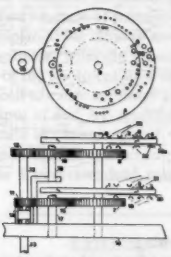
time prior to energizing said element at an operator selected power level.

4,233,499

CONVEYOR CONTROL APPARATUS

John A. Formby, Stratford-Upon-Avon, England, assignor to John Formby & Company Limited, Birmingham, England

Filed Mar. 7, 1979, Ser. No. 18,274
Claims priority, application United Kingdom, Mar. 7, 1978, 08953/78
Int. Cl.³ G06M *7/00*; B65G *43/00*
U.S. Cl. 235—92 MP **13 Claims**



1. A conveyor control apparatus, comprising:
a rotary mechanical means for generating a first set of electrical signals, a second set of electrical signals, and a third set of electrical signals in correlation with the movement of a conveyor having a plurality of on-loading stations and a plurality of off-loading stations;
a counting means for counting said first set of electrical signals;
a decoding means responsive to said counting means for producing electrical outputs;
a gate means responsive to the coincidence of said electrical outputs and said second set of electrical signals;
said counting means and said decoding means including reset means responsive to said third set of electrical signals;
on-loading control indicator means responsive to said gate means;
off-loading indicator means responsive to said gate means;
said on-loading control indicator means associated with said plurality of on-loading stations whereby each member of said plurality of on-loading stations may receive a sequence of signals by which the effective times of on-loading may be indicated in order that consignments on-loaded at such times may reach their respective ones of said off-loading stations during periods of activation of said off-loading indicator means; and said off-loading indicator means associated with said plurality of off-loading stations

whereby each member of said plurality of off-loading stations may receive a sequence of signals by which the effective times of off-loading may be initiated.

4,233,500

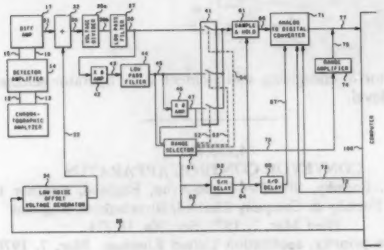
METHOD AND APPARATUS FOR PROVIDING A DIGITAL OUTPUT IN RESPONSE TO AN ANALOG INPUT AND FOR PROVIDING AN ANALOG OUTPUT IN RESPONSE TO A DIGITAL INPUT

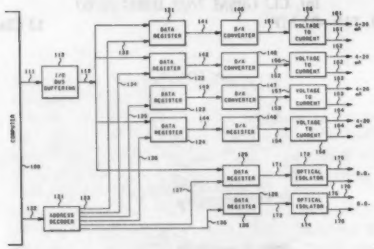
Leroy D. Cordill, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 7, 1977, Ser. No. 840,425

Int. Cl.[2] G06F *3/05, 15/46;* H03K *13/09*

U.S. Cl. 235—310 **47 Claims**





1. Apparatus comprising:

means for producing a first analog signal;

means for producing an offset voltage signal;

means for combining said first analog signal and said offset voltage signal to produce a second analog signal;

first amplifier means;

means for providing said second analog signal as an input to said first amplifier means to thereby establish an amplified second analog signal having a first predetermined relationship to said second analog signal;

an analog-to-digital converter means;

means for establishing a third analog signal representative of the highest voltage level desirable as an input signal into said analog-to-digital converter means;

means for comparing said amplified second analog signal to said third analog signal and for providing said amplified second analog signal as an input signal to said analog-to-digital converter means to be converted into a first digital signal if the voltage level of said amplified second analog signal does not exceed the voltage level of said third analog signal;

means for providing said second analog signal as an input signal to said analog-to-digital converter means to be converted into a first digital signal if the voltage level of said amplified second analog signal exceeds the voltage level of said third analog signal, said offset voltage signal having a voltage level which will reduce the voltage level of said first analog signal to enable said amplified second analog signal to be provided as an input to said analog-to-digital converter means if the difference between the voltage level of said first analog signal, multiplied by the amplification factor of said first amplifier means, and the voltage level of said third analog signal does not exceed the maximum available absolute voltage level of said offset voltage signal multiplied by the amplification factor of said first amplifier means.

4,233,501

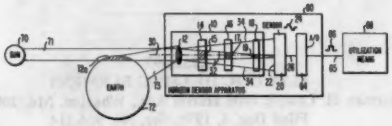
INTERFERENCE SUPPRESSION FOR IMAGING OPTICAL SYSTEMS

John A. Strother, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jul. 19, 1978, Ser. No. 926,085

Int. Cl.[2] G01J *1/20*

U.S. Cl. 250—203 R **6 Claims**



1. An optical imaging apparatus for selectively reducing by a predetermined amount the flux density of radiation in the visible, near-ultraviolet and near-infrared portions of the electromagnetic spectrum from a relatively small very bright object within a larger scene that is less bright, comprising:

a. lens means for imaging radiating objects into an image plane, said lens means having an exit pupil to receive and pass radiation, said exit pupil having an aperture diameter greater than the diameter of the image of said very bright object appearing in said image plane;

b. radiation detecting means responsive to radiation passing through said lens means, said radiation detecting means being positioned at said image plane of said lens means; and

c. filter means including one or more filter elements positioned between said image plane and said lens means responsive to a predetermined level of flux density in the visible and near-ultraviolet portions of the electromagnetic spectrum to reduce in the portion only of said filter element exposed to said predetermined level of light the flux density of radiation of said very bright object.

4,233,502

OPTO-ELECTRONIC FOCUSSING ERROR DETECTION ARRANGEMENT

Gijsbertus Bouwhuis, and Teunis J. Hazerdonk, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 17, 1978, Ser. No. 925,432

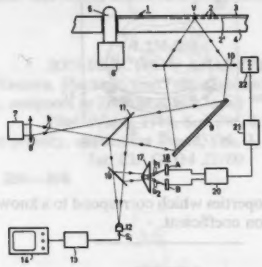
Claims priority, application Netherlands, Apr. 14, 1978, 7803969

Int. Cl.[2] G01D *1/36*

U.S. Cl. 250—204 **2 Claims**

1. An improved opto-electronic focussing error detection arrangement for detecting, in an optical imaging system, a deviation between a radiation reflecting surface and a focussing plane of an objective system, in particular for use in an apparatus for reading a record carrier with an optical radiation-reflecting information structure and an apparatus for optically writing information in a record carrier, which focussing error detection arrangement comprises a beam-splitting element disposed in the path of a radiation beam which is reflected by said surface and, disposed behind the beam-splitting element, a radiation-sensitive detection system which comprises two detectors each associated with one of the subbeams formed by the beam-splitting element, the outputs of the detectors being connected to the inputs of an electronic circuit in

which a focussing-error signal is derived from the detector signals, wherein the detectors are disposed in a plane in which the reflected beam is focussed if the said deviation is zero, that each detector takes the form of a grating and comprises at least three radiation-sensitive strips, that said electronic circuit



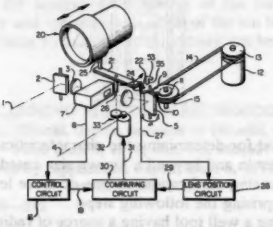
moreover derives a positional-error signal from the detector signals, and that each detector is connected to a separate selection device which effectively divides the detector into two detector sections, the bounding line of the detector sections being adjustable depending on the positional error signal which is applied to a control input of the selection circuit.

4,233,503

AUTOMATIC FOCUS ADJUSTING SYSTEM

Koji Saito, Sayama, Japan, assignor to Nihon Beru-Haueru Kabushiki Kaisha (Bell & Howell Japan, Ltd.), Tokyo, Japan

Filed Mar. 5, 1979, Ser. No. 17,637
Int. Cl.³ G03B *13/20*
U.S. Cl. 250—204 **19 Claims**



1. In an optical instrument having an adjustment mechanism for adjusting the focus of an objective lens and an automatic focusing system in which a scanner driver oscillates a scanning reflector about an axis for imaging a subject on a sensor, and in which a fixed reflector images the subject on the sensor for generating at least a pair of control signals during each complete oscillatory scan of the reflector when spatial image correlation occurs, and including control circuitry for selectively energizing the adjustment mechanism in response to the control signals, the improvement comprising:

means receiving the control signals for generating a distance signal representative of the interval between said control signals;

means for monitoring the position of the lens and the position of the scanning reflector so as to develop first and second lens position signals indicative of the position of the lens relative to the position of the scanning reflector during the forward and return scans of the scanning reflector;

means receiving the lens position signals for generating a focus signal indicative of the interval between said first and second lens position signals; and

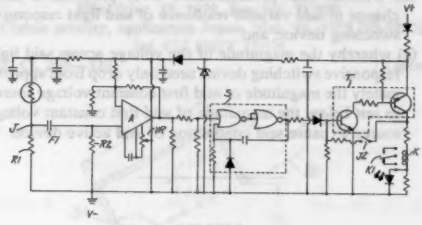
means for comparing the ratio of the distance signal and the focus signal to a predetermined ratio and for automatically adjusting the position of the lens until the ratio of the distance signal to the focus signal is substantially equal to said predetermined ratio.

4,233,504

APPARATUS FOR DETECTING THE PASSAGE OF GLOWING EMBERS

Rudolph W. Kalns, Pembroke, Mass., assignor to Chloride, Incorporated, Tampa, Fla.

Filed Aug. 3, 1978, Ser. No. 930,606
Int. Cl.³ H01J *40/14*
U.S. Cl. 250—214 RC **3 Claims**



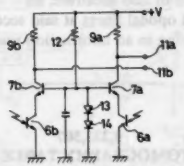
1. A duct system comprising an opaque wall portion and a detector for detecting a single glowing ember travelling through said opaque wall portion, said detector comprising a photo-resistive cell connected in series with a resistor across a voltage supply, the voltage at the junction between the cell and resistor varying as a function of the resistance of the cell, said junction being coupled to the input of an AC responsive device through a differentiator, whereby an ember moving through the field of view of the photo-resistive device causes a drop in resistance of the cell to cause a voltage change at the junction, the input and output of said AC responsive device being proportional to the rate of change of said voltage change at the junction, and means responsive to an output of said AC responsive device above a predetermined magnitude to actuate an alarm.

4,233,505

LIGHT RECEIVING CIRCUIT HAVING FAST RESPONSE TIME AND A STABLE OUTPUT WAVEFORM

Reisuke Sato, Kawagoe, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Aug. 14, 1978, Ser. No. 933,379
Claims priority, application Japan, Aug. 24, 1977, 52/101249
Int. Cl.³ H01J *40/14*
U.S. Cl. 250—214 R **5 Claims**



1. A light receiving dicruit, comprising:

(a) an active device having an emitter, a base and a collector, a first constant voltage source continuously applied to said base, and a second constant voltage source continuously applied to said collector through a first resistance to thereby provide a continuous reverse bias at the junction of said collector and said base;

(b) a light responsive switching device having a variable

resistance and having a first lead and a second lead, said first lead connected to electrical ground and said second lead connected to said emitter of said active device;

(c) whereby the bias voltage at the junction of said emitter and said base of said active device is a function of the value of said first resistance, said second voltage source and said variable resistance, and is forward biased when the level of light on said light responsive switching device reaches a predetermined level, said active device thereby conducting current through said first resistance, said active device and said light responsive device when said predetermined level is reached;

(d) wherein said predetermined level produces a small change in said variable resistance of said light responsive switching device, and

(e) whereby the magnitude of the voltage across said light responsive switching device need only drop from approximately the magnitude of said first constant voltage source to just below the magnitude of said first constant voltage source to cause said conduction of said active device.

4,233,506

PHOTO-SENSOR

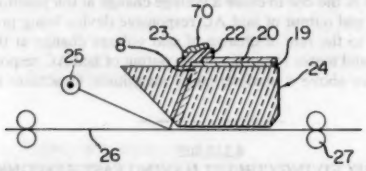
Hideaki Yamamoto; Makoto Matsui, both of Hachioji; Toshihisa Tsukada, Tokyo; Yoshizumi Eto, Sagamihara; Tadaaki Hirai, Koganei, and Eiichi Maruyama, Kodaira, all of Japan, assignors to Nippon Telegraph and Telephone Public Corporation and Hitachi, Ltd., both of, Japan

Filed May 5, 1978, Ser. No. 903,161

Claims priority, application Japan, May 13, 1977, 52-54284

Int. Cl.[2] G02B 5/14

U.S. Cl. 250—227 **22 Claims**



1. A photo-sensor comprising a predetermined substrate, a bundle of optical fibers which is disposed in said substrate and which extends from a first surface to a second surface of said substrate, and an array of photosensitive elements which is integrated onto said substrate, said photosensitive elements having photosensitive parts on an end face of said optical fibers at said first surface of said substrate, an

end face of said optical fibers at said second surface of said substrate serving as an information reading surface.

4,233,507

COMPUTER TOMOGRAPHY TABLE CONTAINING CALIBRATION AND CORRELATION SAMPLES

Donald J. Volz, Mukwonago, Wis., assignor to General Electric Company, Milwaukee, Wis.

Filed May 7, 1979, Ser. No. 36,816

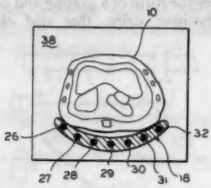
Int. Cl.[3] A61B 6/00; G12B 13/00

U.S. Cl. 250—252 **7 Claims**

1. A table top positioned on a base for supporting a patient between a radiation source and a radiation detector of a computed tomography system, said table top comprising:

a supporting surface which is translatable in the longitudinal direction of the tomography system, and

at least one uniform sample of reference material disposed longitudinally within said table top, said reference material having properties which correspond to a known radiation attenuation coefficient.



4,233,508

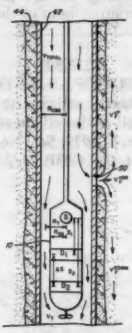
WATER INJECTION PROFILING

Dan M. Arnold, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Dec. 18, 1978, Ser. No. 970,708

Int. Cl.[2] G01V 5/00

U.S. Cl. 250—259 **20 Claims**



1. A method for determining the characteristics of flow of injection water in and beyond a known size cased well borehole having casing perforations at one or more levels within the well comprising the following steps:

(a) providing a well tool having a source of radiation and at least two detectors longitudinally spaced from said source and each other, and having flowmeter means;

(b) positioning said well tool below a level of casing perforation with said radiation source above said detectors;

(c) operating said flowmeter means to monitor fluid flow within said casing below said perforation level, and generating signals indicative of the linear velocity of said fluid flow;

(d) irradiating the borehole environs, including injection water being forced into the borehole, by radiation from said radiation source;

(e) detecting radiation from the activated injection water by operation of said detectors and generating signals representative thereof;

(f) distinguishing count rate data from at least one of said detectors according to two energy ranges of detected radiation;

(g) combining said count rate data and said linear flow velocity obtained by operation of said flowmeter means according to a first predetermined relationship to derive an indication of the linear flow rate of said activated injection water downwardly behind said casing below said perforation level;

(h) positioning said well tool above said level of casing

perforation with said radiation source below said detectors, and repeating steps (d) through (f); and

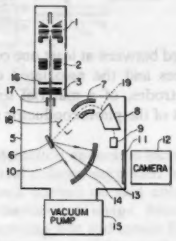
(i) combining said count rate data according to a second predetermined relationship to derive an indication of the linear flow rate of said activated injection water upwardly behind said casing above said perforation level.

4,233,509

ION-ELECTRON ANALYZER

Hifumi Tamura, Hachioji, and Tohru Ishitani, Sayama, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Feb. 1, 1979, Ser. No. 8,258
Claims priority, application Japan, Feb. 3, 1978, 53-10444
Int. Cl.³ G01M *23/00*
U.S. Cl. 250—306 **12 Claims**



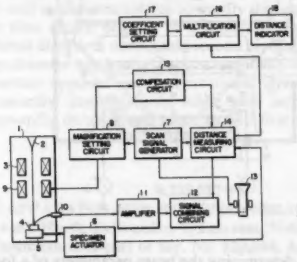
1. An ion-electron analyzer comprising means for producing a combined primary electron beam and negative primary ion beam from the same source of charged particles and for simultaneously bombarding a specimen in vacuum with said combined beam, means for forming an electron diffraction pattern utilizing electrons reflected by said specimen as a result of the bombardment of said specimen by said primary electron beam, and means for analyzing the masses of the secondary ions produced by said specimen as a result of the ion bombardment of said specimen by said negative primary ion beam.

4,233,510

SCANNING ELECTRON MICROSCOPE

Seisiro Sato, Hitachi, Japan, assignor to Hitachi, Ltd., Japan

Filed Dec. 5, 1978, Ser. No. 966,607
Claims priority, application Japan, Dec. 5, 1977, 52-145040
Int. Cl.² G01M *23/00*
U.S. Cl. 250—311 **10 Claims**



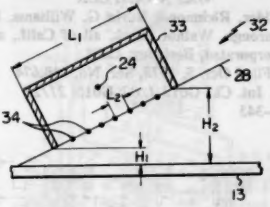
1. A scanning electron microscope comprising means for generating an electron beam; means for scanning a specimen with the electron beam so as to obtain an information signal characteristic of the specimen from said specimen; means for displaying an image of the specimen on the basis of the information signal; means for setting a magnification of the image; means for indicating first and second marks of variable positions on the display means in a manner to be superposed on the image; and means for calculating a distance between first and second points on the specimen corresponding respectively to the first and second marks on the basis of the magnification and positions of said first and second marks, the calculation means including means for multiplying the calculated value of the distance between the first and second points by a predetermined constant so as to compensate for a possible error in the magnification setting.

4,233,511

SCOROTRON CHARGING APPARATUS

Masahide Harada, and Manabu Mochizuki, both of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Mar. 19, 1979, Ser. No. 21,900
Claims priority, application Japan, Mar. 24, 1978, 53-32972
Int. Cl.³ H01T *19/04*
U.S. Cl. 250—325 **7 Claims**



1. A corona charging apparatus for applying an electrostatic charge to a surface which is moved relative to the apparatus including a corona discharge electrode, characterized by comprising:

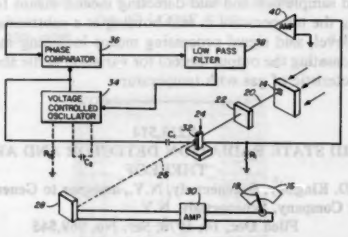
a plurality of parallel wires disposed between the electrode and the surface and extending perpendicular to a direction of movement of the surface relative to the apparatus, a spacing between the wires and the surface progressively increasing in said direction of movement.

4,233,512

THERMOMETER FOR REMOTELY MEASURING TEMPERATURE

Robert E. Rupert, South Dennis, Mass., assignor to Norman C. Anderson, Chatham, Mass.

Filed Oct. 2, 1978, Ser. No. 947,391
Int. Cl.³ G01J *1/00*; G01K *1/00*; H03B *5/30*
U.S. Cl. 250—338 **6 Claims**



1. An instrument for measuring the temperature of an object by means of the infrared radiation emitted therefrom, comprising

(a) a radiation detector adapted to generate an electrical output in response to radiation impinging thereon,

(b) means for forming and directing a beam of radiation against said detector,

(c) temperature indicating means connected to said detector

for converting the electrical output of said detector into a display representative of the temperature of said object,

(d) beam modulating means disposed in the path of said beam for converting said beam into a series of pulses when vibrated in and out of said path,

(e) said modulating means including a piezoelectric reed element adapted to vibrate when subjected to driving signals at a frequency related to the resonant frequency of said element, and,

(f) phase locked loop oscillator circuit means connected to said reed element for operating said reed,

(g) said element adapted to generate a reference signal when vibrated whereby said reference signal functions to lock said circuit means at the resonant frequency of said element.

4,233,513

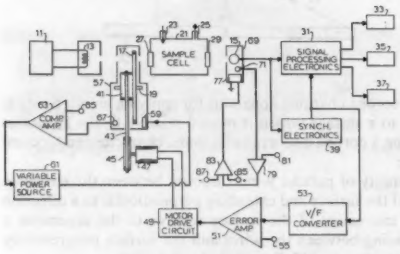
GAS ANALYZER

William L. Elder, Richmond; Kevin G. Williams, Pinole, and Irvin G. Burough, Walnut Creek, all of Calif., assignors to Andros Incorporated, Berkeley, Calif.

Filed Oct. 5, 1978, Ser. No. 948,674

Int. Cl.[2] G01J *1/00*; G01N *21/26*

U.S. Cl. 250—343 **9 Claims**



1. A gas analyzer comprising, a sample cell for containing gas to be analyzed, means for producing and directing infrared energy through said sample cell, means for detecting the infrared energy passing through said sample cell and producing an electrical signal representative thereof, means coupled to said detecting means for processing the electrical signal to produce an output indicating the concentration of the constituents of the gas in said sample cell, a rotary filter wheel for successively and repetitively positioning at least one filter in the path of the infrared energy, a housing enclosing said filter wheel exclusive of said sample cell and said detecting means, means for maintaining the temperature in said housing at a substantially constant level, said signal processing means including means for compensating the output thereof for variation in the absorption characteristic of gas with temperature.

4,233,514

SOLID STATE RADIATION DETECTOR AND ARRAYS THEREOF

Jack D. Kingsley, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 14, 1978, Ser. No. 969,545

Int. Cl.[2] G01T *1/22, 1/24*

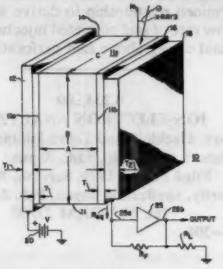
U.S. Cl. 250—370 **29 Claims**

1. A solid state radiation detector, comprising:

a layer having first and second opposed surfaces, said layer being of a photoconductive material characterized by a change in the electrical conductance between said first and second opposed surfaces responsive to absorption of radiation quanta within said layer;

a first electrode fabricated upon the first layer of said surface;

a second electrode fabricated upon the second surface of said layer; and



a film fabricated between at least one of said first and second layer surfaces and the associated one of said first and second electrodes, of a material selected to reduce the dark current of the photoconductor material of said layer.

4,233,515

INSTRUMENT FOR DETERMINING THE RADIATION PARAMETERS OF A FOCUSED CHARGED-PARTICLE BEAM AND METHOD

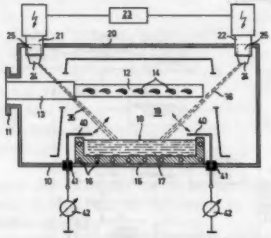
Walter Dietrich, Hanau am Main, and Herbert Stephan, Bruchköbel, both of Fed. Rep. of Germany, assignors to Leybold-Heraeus GmbH, Cologne, Fed. Rep. of Germany

Filed Nov. 24, 1978, Ser. No. 964,091

Claims priority, application Fed. Rep. of Germany, Jul. 19, 1978, 2831602

Int. Cl.[2] G01K *1/08*

U.S. Cl. 250—397 **15 Claims**



1. Device for determining the beam parameters of a focused beam of charged particles guided periodically over a target surface in electron beam melting wherein the target is the surface of a melt in an evaporation crucible, which comprises at least one probe means positioned in front of the target surface in the direction of the beam within the beam trace and in the marginal area of the crucible, said probe means being connected to an electrical display instrument for displaying the detected parameters relating to the beam with respect to the marginal area of the crucible.

4,233,516

X-RAY IMAGE DETECTION APPARATUS

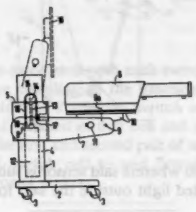
Wulf Trepte, Holmbodavägen, Sweden, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Continuation of Ser. No. 745,557, Nov. 29, 1976, abandoned. This application Sep. 15, 1978, Ser. No. 942,667

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1975, 2557810

Int. Cl.³ G03B *41/16*

U.S. Cl. 250—444 **1 Claim**



1. In x-ray image detection apparatus including a wheeled undercarriage, a vertical column supported by said undercarriage, a mounting block carried on said column for vertical movement relative thereto, an image detector mechanism having a radiation receiving side and means for mounting said image detector mechanism on said mounting block, an improvement wherein: said mounting means comprises an elongated carrier arm with first and second ends, first pivot means for connecting said first end of said carrier arm to said mounting block for pivotal movement of said carrier arm about a horizontal axis between horizontal and substantially vertical positions, second pivot means for mounting said image detector mechanism on said second end of said carrier arm for pivotal movement of said image detector mechanism about a horizontal axis between horizontal and vertical positions, and means interconnecting said first and second pivot means for effecting first and second pivotal movements of said image detector mechanism from a horizontal position, with the radiation receiving side oriented upwardly to receive vertically, downwardly directed radiation, and with the carrier arm in a horizontal position, to a vertical position, with the radiation receiving side oriented vertically and away from the vertical column to receive horizontally directed radiation, and with the carrier arm in a substantially vertical position behind the image detection apparatus; during said first pivotal movement, said image detector mechanism rotates essentially ninety degrees in a first rotational direction and moves upwardly simultaneously while said carrier arm rotates upwardly through an angle of no more than ninety degrees in a direction opposite said first rotational direction, during said second pivotal movement, said image detector mechanism rotates essentially ninety degrees in a direction opposite said first rotational direction and moves downwardly simultaneously while said carrier arm rotates downwardly through said angle in said first rotational direction.

4,233,517

APPARATUS FOR INTERNAL IRRADIATION

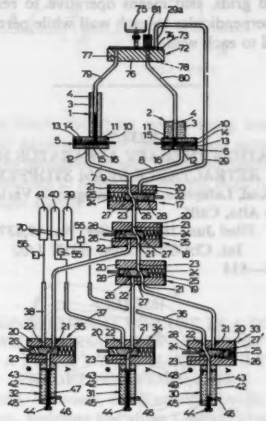
Eric van't Hooft, Dekkershos 7, Leersum, Netherlands

Continuation-in-part of Ser. No. 823,864, Aug. 11, 1977, abandoned. This application Dec. 13, 1978, Ser. No. 969,055

Int. Cl.² G21F *5/02*

U.S. Cl. 250—497 **8 Claims**

1. Apparatus for internal irradiation, comprising a plurality of neutral balls, a plurality of radioactive balls, said neutral balls having the same diameter as said radio-active balls, a distributor for composing a contiguous ball row out of the said neutral and radio-active balls, an applicator tube adapted to be introduced into a body cavity and provided with an internal channel having a narrow end portion parssing through a shoulder into the remaining wider portion of said internal channel, said narrow end portion having substantially the same length as said ball row and being adapted to admit the same, a final ball having a larger diameter than the said radio-active and neutral balls, so that it is not admitted by said narrow end portion, intermediate container means in said distributor for adding said final ball to said ball row at the end thereof, pneumatic means for transferring said ball row and said added final ball from said intermediate container means to said applicator



tube in such manner that said added final ball is arrested by the shoulder and is pressed against said shoulder so as to keep the balls of said ball row in the right places during the irradiation, said pneumatic means being further used to return said ball row and said final ball to said intermediate container means after the termination of the irradiation, an adjustable pressure switch connected to the wider portion of said applicator tube, said pressure switch determining whether pneumatic pressure is sufficient to keep the associated final ball pressed against the associated shoulder.

4,233,518

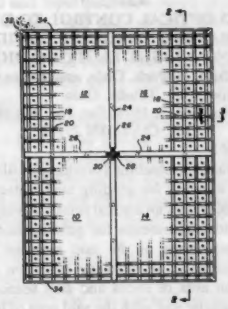
FUEL STORAGE RACK

Sean Auyeung, Windsor, and William W. Etzel, East Hartland, both of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Nov. 6, 1978, Ser. No. 958,289

Int. Cl.² G21F *5/00*

U.S. Cl. 250—507 **4 Claims**



1. A fuel storage rack for the storage of nuclear fuel assem-

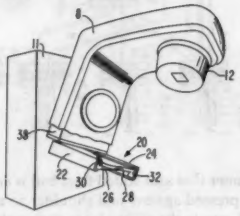
blies in a pool of water comprising: a rectangular pool having four walls; four grids, each formed of fixedly connected cross members and positioned in the four quadrants of the pool; means for supporting each grid at an upper elevation permitting grid expansion movement with respect to the walls; means for supporting fuel to be stored within said grids, located at a lower elevation; means for supporting each grid at the two adjacent walls, while permitting expansion of the grid parallel to at least one wall; means for restraining horizontal motion of each of said grids, said means operative to restrain in both directions perpendicular to each wall while permitting expansion parallel to each wall.

4,233,519

RADIATION THERAPY APPARATUS HAVING RETRACTABLE BEAM STOPPER

George L. Coad, Lafayette, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Jun. 18, 1979, Ser. No. 49,837
Int. Cl.³ G21F *5/04*; G21K *1/02*
U.S. Cl. 250—514 **20 Claims**



1. Radiation therapy apparatus comprising a radiation source, support means for rotating said radiation source about a target area, beam stopper means retractably attached to said support means and positionable to receive radiation passing through the target area, said beam stopper means including first and second arms pivotally attached to said support means, third and fourth arms pivotally attached to said first and second arms, respectively, a beam stopper, means for attaching said third and fourth arms to said beam stopper, and drive means coupled to one of said arms whereby said arms rotate and said beam stopper translates linearly.

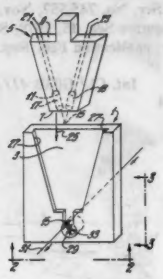
4,233,520

ELECTRO OPTICAL CONTROL TO DETECT A FILAMENT PASSING THROUGH A GUIDE EYE AND USING A LIGHT EMITTING DIODE

Sheldon A. Canfield, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Sep. 7, 1978, Ser. No. 940,068
Int. Cl.³ G01N *21/86*
U.S. Cl. 250—561 **8 Claims**

1. An apparatus for detecting a continuous filamentary material comprising a means for guiding said material along a primary direction of travel, an optical sensor having a light source and light detector, said means for guiding said material constraining the movement of the said material in a direction generally transverse to its primary direction of travel, said sensor having an area of focus and said sensor being placed adjacent said material and with the said area of focus of the said sensor being substantially at the outer limit of said constrained transverse movement, said detector sensing light from said source reflected from said material when said material enters said area of focus as said material moves within its said transverse direction, and wherein said sensor is substantially insensitive to said reflected light outside the said focus.

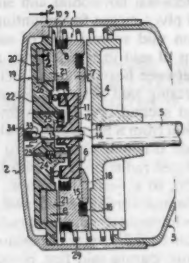


4,233,521

ELECTRIC INERTIA-TYPE STARTER DEVICE FOR A HEAT ENGINE

Rene Pouget, Levallois, France, assignor to Aciers et Outillage Peugeot, Audincourt, France

Filed Mar. 1, 1978, Ser. No. 882,465
Claims priority, application France, Mar. 2, 1977, 77 06080
Int. Cl.³ H02K *7/00*
U.S. Cl. 290—38 B **13 Claims**



1. An electric inertia-type starter device for a heat engine, comprising an electric motor including a stator and a rotor which define therebetween a planar airgap, said rotor having a high mechanical inertia and acting as a flywheel, a member for connection to the driving shaft of the heat engine, and releasable clutch means for temporarily coupling the rotor to said member, said rotor having an outside diameter substantially equal to the outside diameter of said member.

4,233,522

CAPACITIVE TOUCH SWITCH ARRAY

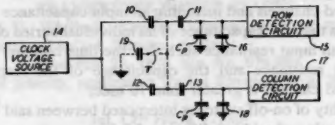
William L. Grummer, Cheshire, and Hendrik B. Hendriks, Becket, both of Mass., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 30, 1978, Ser. No. 956,278
Int. Cl.² H01H *35/00*
U.S. Cl. 307—116 **22 Claims**

1. A capacitive touch switch array, comprising:
(a) an array of touch sensitive switch cells each including a first pair of series capacitors and a second pair of series capacitors,
(b) a signal source coupled to said first and second pair of series capacitors,
(c) first signal detection circuit means, said first pair of series

capacitors coupling the signal from said signal source to said first signal detection circuit means,

(d) second signal detection circuit means, said second pair of series capacitors coupling the signal from said signal source to said second signal detection circuit means, and



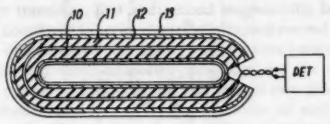
(e) touch means associated with each switch cell for providing capacitive coupling of the junctions of each pair of series capacitors of a selected switch cell to ground for actuating said selected switch cell and varying the signal coupled by the first and second pair of series capacitors of said selected switch cell to said first and second signal detection circuits means.

4,233,523

PRESSURE SENSITIVE DEVICE

Lars Jarder, 41 Lomvaegen, Sollentuna, Sweden (S-191 56), and Bengt Ahlstroem, 2A Malmvaegen, Sollentuna, Sweden (S-191 61)

Filed Jan. 22, 1979, Ser. No. 5,468
Claims priority, application Sweden, Jan. 31, 1978, 7801148
Int. Cl.[2] H01H *36/00*
U.S. Cl. 307—119 **5 Claims**



1. A pressure-sensitive device capable of responding electrically to applied mechanical forces, said device comprising: a body of a flexible, non-conductive material; at least one electrically conductive loop which has opposite ends thereto and is embedded in the said body; a reactance-dependent detecting circuit which is connected to the said loop ends externally of said body and is sensitive to the inductive reactance of the said loop; and a screen of electrically conductive material incorporated in said body and extending alongside the said loop; said body being deformable on application of mechanical forces thereto so as to cause the inductive reactance of the loop to change.

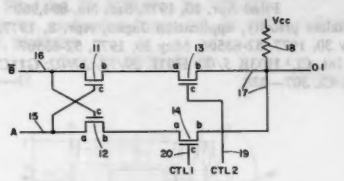
4,233,524

MULTI-FUNCTION LOGIC CIRCUIT

Edward J. Burdick, Los Gatos, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Jul. 24, 1978, Ser. No. 926,873
Int. Cl.[3] H03K *19/088, 19/094, 19/20*
U.S. Cl. 307—205 **11 Claims**

1. A multi-function logic circuit for simultaneously receiving data logic signals and control logic signals for performing selectable logical operations on said data logic signals in response to said control logic signals, and for generating output logic signals representing the result of said logical operation, comprising: first, second, third, and fourth switching means, each of said switching means having an input terminal, an output terminal, and a control terminal for switching data logic signals applied to said input terminal to said output terminal in response to control logic signals applied to said control terminal, said input terminals and said control terminals of said first and second switching means being cross-coupled together and coupled to respective input leads for receiving said data logic signals, said output terminals of said first and second switching means being coupled respectively to said input terminals of said third and fourth switching means, said output terminals of



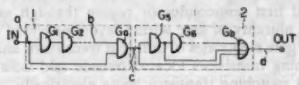
said third and fourth switching means being coupled to an output lead for generating said output logic signals thereon, and said control terminals of said third and fourth switching means being coupled to respective control leads for receiving said control logic signals.

4,233,525

ELECTRONIC CIRCUIT FOR USE IN A DIGITAL CIRCUIT WHICH PREVENTS PASSAGE OF PULSES HAVING A PULSE WIDTH NARROWER THAN A PREDETERMINED VALUE

Yukio Takahashi, Kawasaki, and Kazuhiro Toyoda, Yokohama, both of Japan, assignors to Fujitsu Limited, Japan

Filed Mar. 17, 1978, Ser. No. 887,920
Claims priority, application Japan, Mar. 17, 1977, 52-29466
Int. Cl.[3] H03K *5/01, 5/159, 9/08*
U.S. Cl. 307—234 **21 Claims**



1. An electronic circuit for use in a digital circuit to prevent the passage of pulses having pulse width narrower than a predetermined value and for preserving the pulse width of transmitted pulses, said electronic circuit comprising:

a first circuit for receiving an input pulse, said first circuit comprising a delay circuit and a first gate having two input terminals, one of said two input terminals of said first gate comprising means for receiving said input pulse to said first circuit and the other of said two input terminals comprising means for receiving a delayed pulse corresponding to said input pulse as a result of passing through said delay circuit, said gate of said first circuit further comprising means for generating an output pulse of said first circuit when said input pulse has a pulse width larger than a predetermined delay time corresponding to said delay circuit;

a second circuit comprising means for receiving the output pulse of said first circuit and for forming a pulse having a pulse width which is substantially the same as that of said input pulse of said first circuit when said input pulse has a pulse width larger than that corresponding to said predetermined delay time, said means of said second circuit comprising:

a second gate, and a group of first delay gates connected in series, the total delay time of said group of first delay gates being substantially the same as said predetermined width value, and the output of said first circuit and of each said first delay gates being input to said second gate.

4,233,526

SEMICONDUCTOR MEMORY DEVICE HAVING MULTI-GATE TRANSISTORS

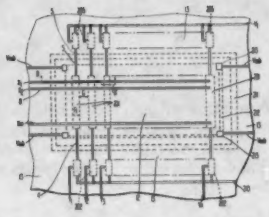
Yukinori Kurogi, and Kiyoshi Sugibuchi, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Apr. 10, 1978, Ser. No. 894,960

Claims priority, application Japan, Apr. 8, 1977, 52-40522; May 30, 1977, 52-63506; May 30, 1977, 52-63507

Int. Cl.³ H03K *5/00;* **H01L** *29/78, 27/02;* **G11C** *11/34*

U.S. Cl. 307—238 **12 Claims**



1. A semiconductor memory device comprising; a first semiconductor region of one conductivity type; a plurality of memory transistors formed in said first semiconductor region and arranged in parallel with each other, each of said memory transistor including a pair of source and drain regions of an opposite conductivity type formed in a major surface of said first semiconductor region, a gate insulating layer formed on said major surface between said source and drain regions, a plurality of gate electrodes formed on said gate insulating layer and laterally separated from each other, and a plurality of opposite conductivity type regions formed in said first semiconductor region under the respective intervals between adjacent gate electrodes; an isolation region surrounding said first semiconductor region to prevent parasitic current flow to or from said first semiconductor region through said isolation region; a plurality of gate wiring layers provided to interconnect said gate electrodes of different transistors; and a plurality of switching transistors located outside said isolation region, each said switching transistor being electrically connected at its drain region to said source region of each said memory transistor, respectively.

4,233,527

CHARGE INJECTION DEVICE OPTO-ELECTRONIC SENSOR

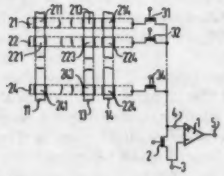
Rudolf Koch, Munich, and Hans-Joerg Pfleiderer, Zorneding, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jun. 16, 1976, Ser. No. 696,478

Claims priority, application Fed. Rep. of Germany, Jun. 20, 1975, 2527626

Int. Cl.³ H03K *3/42;* **H01L** *29/78, 27/14, 31/00*

U.S. Cl. 307—311 **5 Claims**



1. An opto-electronic sensor comprising:

a doped semiconductor substrate;

at least one light-permeable electrically insulating layer carried on said substrate;

a matrix of electrodes arranged in lines and columns on said insulating layer, the electrodes of a respective line electrically connected together;

a plurality of buried channels, each below a respective column electrode in said substrate and doped oppositely to said substrate and each having a capacitance;

a voltage amplifier including an input connected to said buried channels and including an input capacitance which is less than the capacitance of an individual buried channel and an input resistance such that the time constant of the input resistance and the capacitance of the respective buried channel is greater than 10 nsec;

a plurality of on-off switches interposed between said buried channels and said amplifier; and

an additional on-off switch connecting said input of said amplifier to an external terminal contact.

4,233,528

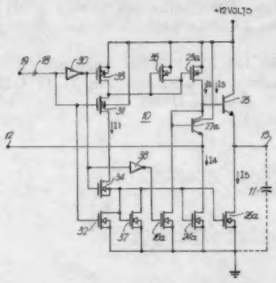
SAMPLE-AND-HOLD CIRCUIT WITH CURRENT GAIN

John G. Hogeboom, Ottawa, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Oct. 23, 1978, Ser. No. 953,452

Int. Cl.³ G11C *27/02;* **H03K** *17/56*

U.S. Cl. 307—353 **8 Claims**



1. A sample-and-hold circuit for receiving a signal, for charging a storage means to a voltage level representative of the magnitude of said signal, for selectively maintaining the charge on said storage means for a given period of time, and suitable for LSI (large scale integration) implementation, said sample-and-hold circuit comprising:

an input electrode for receiving said signal;

an output electrode for connection to said storage means;

a gate electrode for receiving a control signal which controls the alternating of said circuit between a sample mode and a hold mode;

a variable impedance device, responsive to the signal appearing on said input electrode, for controlling the flow of current into said storage means via said output electrode;

switch means, responsive to said gate electrode, for altering said sample-and-hold circuit between the sample mode of operation and the hold mode of operation, said switch means having a first state and a second state, said first state allowing biasing currents to be applied to said variable impedance device for energizing said device into a quiescent state of conduction, said second state removing bias from said variable impedance device so that said variable impedance device is in the non-conducting state, and said storage means is isolated from any conducting portion of said circuit, so that said storage means maintains its charge for said given period of time; and

wherein said variable impedance device is a bipolar transistor, wherein said biasing currents are controlled by insulated gate field effect transistors, wherein said switch means comprise both a bipolar transistor and insulated

gate field effect transistors, and wherein said given period of time is at least 124 micro-seconds.

4,233,529

TRANSISTORS POWER STAGES

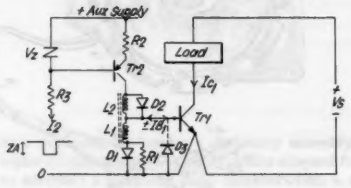
Reginald H. Whitlock, Rugeley, England, assignor to Thorn Automation Limited, Rugeley, England

Filed Feb. 22, 1978, Ser. No. 879,880

Claims priority, application United Kingdom, Feb. 28, 1977, 8294/77

Int. Cl.³ H03K *17/80*

U.S. Cl. 307—414 **12 Claims**



1. A transistor power switching stage and driver circuit comprising a driver transistor having first and second output electrodes and a control electrode, a power transistor having first and second output electrodes and a control electrode, a switching control circuit connected to the control electrode of said driver transistor, first and second magnetically coupled inductors connected in series electrically to said second output electrode of said driver transistor, a connection between the junction of said series-connected inductors and the control electrode of said power transistor, and at least one diode connected between said second output electrode of said driver transistor and said control electrode of the power transistor.

4,233,530

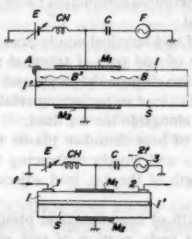
ELASTIC SURFACE WAVE DEVICE

Nobuo Mikoshiba, Sendai, and Shoichi Minagawa, Ageo, both of Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed Oct. 5, 1978, Ser. No. 948,826

Int. Cl.² H03F *7/00*

U.S. Cl. 307—424 **4 Claims**



1. An elastic surface wave device, comprising: a laminate composed of a semiconductor layer, a piezoelectric material layer, and a protective film layer interposed therebetween; a first electrode on a surface of said piezoelectric material layer; a d.c. bias voltage source connected to said first electrode; a pumping power source connected to said first electrode; and a second electrode on a surface of said semiconductor layer for ohmic contact therewith.

4,233,531

ASSEMBLING AND ENERGIZING COMPACT MOTORS

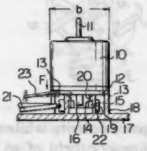
Hideharu Nakano, Omihachiman, and Shinichi Sakata, Hikone, both of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Jul. 31, 1978, Ser. No. 929,227

Claims priority, application Japan, Jul. 30, 1977, 52-92693; Jul. 30, 1977, 52-92694

Int. Cl.² H02K *15/00*

U.S. Cl. 310—42 **18 Claims**



1. A device for simultaneously achieving a mechanical engagement of a motor with a housing of an instrument for containing said motor to utilize its rotation output and an electric connection for feeding power to the motor, comprising

power feeding means consisting of a pair of motor input terminals connected to an exciting coil of the motor and projected at one end out of the motor body and a pair of current source power feeding terminals fixed engageably in contact with said motor input terminals in the positions on the inner surface of the housing to which the motor should be fitted and connected to power feeding wires,

means for fixing a motor in the direction of projecting motor power feeding terminals consisting of a first engaging element on the motor side for defining a first distance along the projecting direction of said motor input terminals at least on the same surface of the motor out of which said motor input terminals project and a first engaging element on the housing side arranged on the inner surface of the housing adjacent said current source power feeding terminal, and engageable with said first engaging element on the motor side for defining a second distance of substantially the same value as said first distance in the same direction as said first distance, and

means for preventing rotations of the motor in said rectangularly intersecting direction consisting of a second engaging element on the motor side having at least one engaging surface extending at least in the direction of intersecting at right angles with the projecting drection of said motor input terminals at least on the same surface of the motor out of which said motor input terminals project and a second engaging element on the housing side engageably arranged on the engaging surface with said second engaging element on the motor side,

wherein the terminals and engaging elements on the motor and housing sides of said power feeding, fixing and rotation preventing means are brought into an engageable relation with each other by the movement of the motor fitting position of said housing in the direction of projecting the motor input terminals.

4,233,532

MODULAR DYNAMOELECTRIC MACHINE

Ernie B. Esters, 15915 Rutherford, Detroit, Mich. 48227

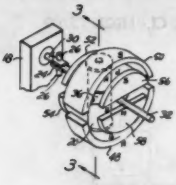
Filed Jul. 10, 1978, Ser. No. 923,175

Int. Cl.³ H02K *37/00*

U.S. Cl. 310—46 **10 Claims**

1. A dynamoelectric machine comprising a housing, a shaft assembly rotatably supported in said housing, a winding mounted on said shaft assembly for rotation therewith, a magnetic field stator having six independent field elements dis-

posed in said housing, said stator comprising a first pair of diametrically disposed field elements, and two pairs of laterally disposed flat field elements, each of said pairs of laterally disposed field elements being supported on opposite lateral sides of said winding, and said field elements being arranged such that one end of said winding is at a given moment within



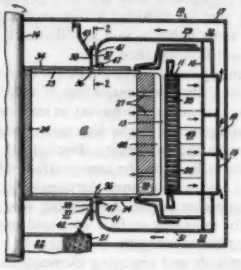
a magnetic field of a given polarity while the other end of said winding is within a magnetic field of an opposite polarity, a commutator mounted on said shaft for rotation therewith, wiring means connecting said winding to said commutator, and brush means each connected to a terminal and engaged with said commutator.

4,233,533

ROTOR RIM-VENTILATED GENERATOR WITH TURNING VANES FOR ROTOR INLET COOLANT GAS

Harold Lown, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 15, 1978, Ser. No. 969,684
Int. Cl.³ H02K 9/00
U.S. Cl. 310—59 **7 Claims**



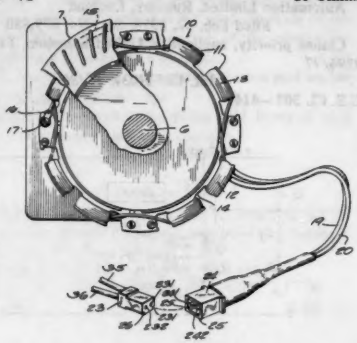
1. A rotor rim-ventilated generator having a stator member, a rotor member concentric therewith and a gap between said rotor and stator members, means connected to said rotor member for driving said rotor member, said stator member having windings thereon and said stator member and the rim of said rotor member each having ventilation ducts extending therethrough in the generally radial direction for the passage of cooling gas, the improvement comprising means effective during operation for simultaneously admitting coolant gas flow to said rotor member and turning said gas flow in the direction of rotor rotation, said admitting and turning means being stationary and being disposed adjacent each of the two generally planar walls of said rotor member radially inward of said rotor rim in flow communication with the radially inner end of the rotor rim ventilation ducts.

4,233,534

CONNECTIONS FOR SMALL ENGINE AUXILIARY ELECTRICAL SYSTEM

Paul A. Tharman, Milwaukee, Wis., assignor to Briggs & Stratton Corporation, Wauwatosa, Wis.

Continuation-in-part of Ser. No. 835,448, Sep. 22, 1977, abandoned. This application Nov. 20, 1978, Ser. No. 962,054
Int. Cl.³ H02K 11/00
U.S. Cl. 310—71 **10 Claims**



1. In combination with an internal combustion engine of the type adapted to power a machine and to provide a source of energization for auxiliary electrical equipment on the machine comprising an a.c. load circuit and one requiring unidirectional current, said engine having permanent magnet means carried by a part of the engine that rotates when the engine is running and a pair of alternator windings mounted on the engine body for cooperation with the permanent magnet means, one end of one alternator winding being connected with an a.c. lead, one end of the other alternator winding being connected with a d.c. lead, and the other ends of the alternator windings being grounded to the engine body, means on the engine providing for connection of said leads with the machine load circuits and for rectification of current to be fed to the d.c. load circuit, the last mentioned means comprising:

A. a plug element of a quick-disconnect connector comprising male and female elements, each of which has a pair of terminal members that are cooperable with the terminal members of the other plug element, one of said plug elements having a body portion, the a.c. lead being secured to one of the terminal members of the body portion;

B. a diode having a pair of oppositely projecting terminal conductors,

(1) one of said terminal conductors being connected to the d.c. lead, and

(2) the other of said terminal conductors being connected to the other of said pair of terminal members of said plug element to dispose the diode and its adjacent portion of the d.c. lead in projecting relation to said body portion and alongside the a.c. lead;

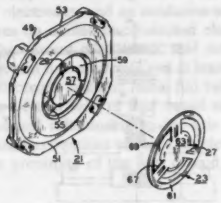
C. a first length of heat shrunken plastic tubing extending from said body and snugly embracing the diode and a substantial length of the d.c. lead adjacent to the diode; and

D. a second length of heat shrunken plastic tubing snugly embracing said body portion of said plug element and extending a substantial distance therefrom in snugly surrounding relationship to the diode, substantial portions of the a.c. and d.c. leads, and the first length of heat shrunken plastic tubing, and cooperating with said first length of tubing to insulate and protect the diode and its connections and to form a rigid, sturdy, unified assembly with the diode, said plug element and adjacent portions of said leads.

4,233,535
PRIME MOVER HAVING A LEAKAGE FLUX CONDUCTING DEVICE SECURED THERETO

Michael R. Barone, Sycamore, Ill., assignor to General Electric Company, Fort Wayne, Ind.

Filed Mar. 15, 1978, Ser. No. 886,672
Int. Cl.[2] H02K 1/12
U.S. Cl. 310—256 12 Claims



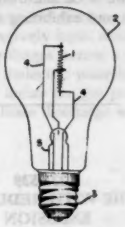
1. In a prime mover having a stationary assembly with at least a pair of opposite pole winding means adapted for excitation to establish a magnetic field therebetween, a rotatable assembly coupled in magnetic relation with the stationary assembly, at least one non-ferrous end plate having a pair of opposite faces and disposed in journaling engagement with the rotatable assembly, means arranged on one of the opposite faces of the end plate for providing a short-circuiting path to conduct leakage flux emanating from the magnetic field upon the establishment thereof generally across the one opposite face of the end plate between the at least winding means pair with the path providing means remaining unsaturated by the conducted leakage flux, means in the path conducting means for the passage therethrough of ambient air past the end plate into cooling relation with the rotatable assembly and the stationary assembly, and means for securing the path providing means in a preselected assembly position on the one opposite face of the end plate; the improvement comprising a plurality of abutment surfaces on the one opposite face of the end plate, and the securing means including a plurality of generally elongate deformable fingers lanced from the path providing means, each of said fingers of said plurality thereof having a pair of opposite end portions interposed between a pair of opposite side edges with one of said opposite end portions being respectively integral with the path providing means and the other of said opposite end portions arranged so as to be respectively urged into gripping engagement with said abutment surfaces of said plurality thereof in response to the deformation of said fingers upon the disposition of the path providing means in its preselected assembly position on the one opposite face of the end plate, and said fingers respectively having a length between said opposite end portions predeterminately greater than the width between said opposite side edges so as to predeterminately limit the force exerted by the deformation of said fingers in order to grippingly engage said other end portions thereof with said abutment surfaces and thereby prevent the displacement of the path providing means for its preselected assembly position on the one opposite face of the end plate.

4,233,536
INCANDESCENT LAMP GETTER

John F. Waymouth, Marblehead; Edmund M. Passmore, Gloucester, and George L. Duggan, Bedford, all of Mass., assignors to GTE Products Corporation, Stamford, Conn.

Filed Dec. 18, 1978, Ser. No. 970,294
Int. Cl.[3] H01K 1/56
U.S. Cl. 313—174 3 Claims

1. An incandescent lamp comprising a glass envelope having a gas fill, a tungsten filament within the envelope, and getter means disposed within the envelope, said getter means comprising carbon and a gas in elemental form, said gas in elemental form being present in a quantity which enhances the getter-ing effect of the carbon by reacting therewith to transfer and retain the carbon in a gaseous phase, the quantity of carbon being greater than about 30 parts per million of the weight of

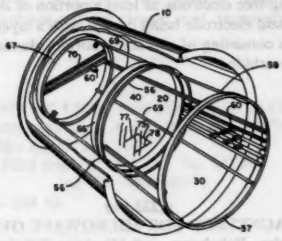


the filament, said gas in elemental form being hydrogen and said quantity thereof being greater than 30 parts per million of the filament weight.

4,233,537
MULTICUSP PLASMA CONTAINMENT APPARATUS

Rudolf Limpaecher, 45 Parsonage La., Topsfield, Mass. 01983

Filed Sep. 18, 1972, Ser. No. 290,076
The portion of the term of this patent subsequent to Aug. 11, 1994, has been disclaimed.
Int. Cl.[2] H01J 17/26
U.S. Cl. 313—231.3 16 Claims



1. Plasma containing apparatus comprising,
(a) a container vacuum tight to maintain the plasma pressure,
(b) a plasma chamber within said container,
(c) said chamber having magnetic multipole ion reflecting walls made up of an array of at least thirty magnetic poles of alternating sign, and
(d) means for injecting electrons into said chamber in sufficient quantity to maintain the resulting plasma at a substantial negative potential.

4,233,538
LUMINESCENT LEAD-ACTIVATED ALKALINE EARTH METAL RARE EARTH METAL BORATES AND MERCURY VAPOR DISCHARGE LAMP CONTAINING THE SAME

Willebrordus H. M. M. van de Spijker, and Willem L. Konijnendijk, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 18, 1979, Ser. No. 31,244
Claims priority, application Netherlands, Apr. 20, 1978, 7804197
Int. Cl.[3] C09K 11/46
U.S. Cl. 313—486 10 Claims

1. A luminescent lead-activated alkaline earth metal rare earth metal borate having a hexagonal crystal structure and a composition defined by the formula

$Me_{1-p}Pb_pLa_{1-x-y}Y_xGd_yBO_4$,

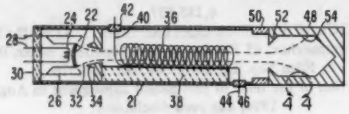
wherein Me represents strontium and/or calcium, where $0.005 \leqq p \leqq 0.30$ and $0 \leqq x \leqq 0.1$, and wherein $0 \leqq y \leqq 0.5$ when at least 75 mole% of Me is Ca and $0 \leqq y \leqq 0.1$ when less than 75 mole% of Me is Ca and exhibiting an emission maximum of 465–470 nm.

4,233,539

ELECTRON TUBE WITH REDUCED SECONDARY EMISSION

Louis R. Falce, Redwood City, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Mar. 5, 1979, Ser. No. 17,316
Int. Cl.³ H01J *23/08*
U.S. Cl. 315—5.38 **6 Claims**



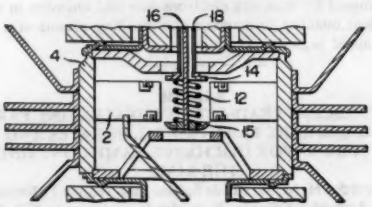
1. An electron tube comprising a copper electrode capable of collecting free electrons, at least a portion of the collecting surface of said electrode being coated with a layer of material of the class consisting of aluminum boride, aluminum carbide and boron carbide.

4,233,540

MAGNETRON FOR MICROWAVE OVEN

Norio Tashiro, Yokohama, and Hirokazu Takahashi, Tokyo, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jan. 9, 1979, Ser. No. 3,426
Claims priority, application Japan, Jan. 18, 1978, 53/3797
Int. Cl.³ H01J *25/50*
U.S. Cl. 315—39.51 **6 Claims**



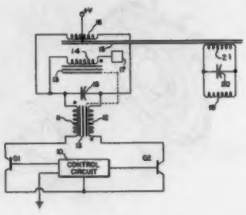
1. A magnetron for a microwave oven comprising a hollow cylindrical anode having a plurality of strapped anode vanes and a cathode including a coiled filament disposed coaxially with the hollow cylindrical anode, the ratio of the thickness d of said filament in the axial direction of the cathode to the pitch p of turns of the coiled filament in the axial direction of the cathode being 0.3 or less, said magnetron suppressing noise generation in the frequency range of approximately 0.5 to 1.5 Mhz.

4,233,541

START WINDING FOR SOLENOIDAL ELECTRIC FIELD DISCHARGE LAMPS

Armand P. Ferro, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed May 24, 1979, Ser. No. 42,217
Int. Cl.³ H01J *11/00, 65/04*
U.S. Cl. 315—70 **8 Claims**



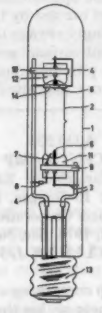
1. A solenoidal electric field lamp apparatus comprising:
a light-transmissive evacuable envelope containing an ionizable gaseous medium and having a phosphor disposed on said envelope for absorption of electromagnetic radiation at a first optical frequency from said medium and reradiation of electromagnetic radiation at a second optical frequency;
a magnetic lamp core electromagnetically coupled to said medium, said core having a conductive winding thereon;
an electronic ballast circuit for supplying radio frequency energy;
means for providing ballast reactance for said ballast circuit;
a transformer having a core, a primary winding electromagnetically coupled to said ballast circuit and a secondary winding coupled to said lamp core; and
a start winding disposed on a magnetic core and connected to act as an autotransformer with said transformer secondary winding and being futher connected to a starting electrode disposed proximal to said gaseous medium.

4,233,542

HIGH-PRESSURE DISCHARGE LAMP

Franciscus M. P. Oostvogels; Gustaaf Melis, and Aime P. A. M. Van Laarhoven, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 18, 1978, Ser. No. 952,369
Claims priority, application Netherlands, Nov. 7, 1977, 7712215
Int. Cl.³ H01J *7/44, 13/46*
U.S. Cl. 315—73 **2 Claims**



1. A high pressure discharge lamp which comprises: a sealed vacuum-tight light-pervious lamp envelope, a sealed vacuum-

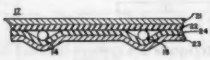
tight light-pervious elongated discharge vessel disposed in said envelope, the space between said envelope and said vessel being evacuated or containing a non-oxidizing gas atmosphere, said lamp further including first and second elongated electrodes disposed in spaced relation from each other within said vessel with the axis of each electrode and said vessel generally parallel, an ionizable fill disposed within said vessel, respective electrical current conductors extending through the wall of said lamp envelope and through the wall of said discharge vessel to said electrodes, and an oxidation-sensitive metal foil which fractures on oxidation connected electrically in series with one of the current conductors, said metal foil being disposed adjacent said first electrode and at least partly intermediate said first electrode and said metal foil being disposed adjacent a portion of said wall of said vessel enclosed by planes disposed in normal relationship to the axis of said first electrode of the axial extremities of said first electrode and also in the immediate proximity of the wall of said discharge vessel.

4,233,543

INTERNAL SHUNT FOR SERIES CONNECTED LAMPS

Robert L. Hickok, Richmond Heights, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 9, 1977, Ser. No. 859,056
Int. Cl.³ H01K *1/70*
U.S. Cl. 315—75 **19 Claims**



1. An internal shunt for series connected lamps having at least two inner lead wires comprising:

a first flat strip of aluminum foil having an oxide coating on at least one side thereof;

a second strip of aluminum foil having an oxide coating on at least one side thereof and indentations on said at least one side thereof for receiving said lead wires; and

said first and second strips in combination surround a portion of both of said wires and are individually positioned approximately parallel to each other on opposite sides of said lead wires, the oxide coating on each strip being in contact with both led wires, and said strips being bonded together adjacent the ends thereof and at a location intermediate said lead wires, and the bonding of the strips being so spaced from said lead wires to thereby avoid damaging said oxide coatings at said lead wires.

4,233,544

INPUT-KEEP ALIVE ARRANGEMENT FOR PLASMA CHARGE TRANSFER DEVICE

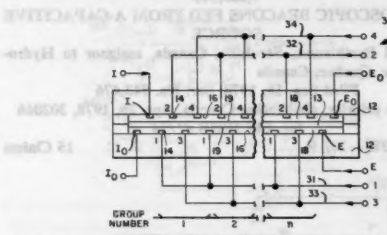
William E. Coleman, Colorado Springs, Colo., assignor to NCR Corporation, Dayton, Ohio

Filed May 9, 1979, Ser. No. 37,586
Int. Cl.³ H05B *41/30*
U.S. Cl. 315—169.2 **9 Claims**

6. A method of entering information into and erasing information in a plasma gas transfer device having a first pair of electrodes for entering information in the form of charges into an adjacent array of charge transfer electrodes and a second pair of electrodes adjacent the array for removing charge information from the device, each of the first and second pairs and the charge transfer electrodes being covered by dielectric material and thereby isolated from the gas, comprising:

selectively applying voltages across a first cell having walls defined by the dielectric material covering one of the first pair of electrodes and an adjacent one of the array of charge transfer electrodes to discharge gas within the first cell and thereby selectively input charge to the array;

repetitively applying voltages across a second cell having walls defined by the dielectric material covering the first pair of electrodes to ionize the gas proximate the second cell and thereby facilitate discharge within the first cell;



selectively applying synchronous voltages to the array of charge transfer electrodes to transfer the charge along the array; and

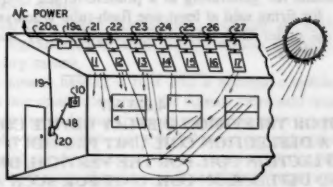
selectively applying voltages across a third cell having walls defined by the dielectric material covering the second pair of electrodes for receiving the charge from the array and, by selective ionization of the medium based upon the applied voltage and the charge state, terminating charge transfer.

4,233,545

AUTOMATIC LIGHTING CONTROL SYSTEM

Lee R. Webster, and Gary J. Woods, both of 1670 Highway AIA, Satellite Beach, Fla. 32937

Filed Sep. 18, 1978, Ser. No. 942,977
Int. Cl.² H01J *40/14*
U.S. Cl. 250—214 AL **13 Claims**



1. An illumination control apparatus for controlling the flow of electrical energy from a source thereof to a plurality of lighting modules for supplementing natural illumination so as to maintain a desired level of total illumination within an interior space, said illumination control apparatus comprising in combination:

a plurality of power controllers each interposed between the source of electrical energy and one of the lighting modules, with each of said power controllers regulating the flow of electrical energy therethrough responsive to receiving a corresponding power control signal;

a photosensitive detector for generating an illumination signal representative of the total effective level of natural and artificial illumination within the interior space;

illumination limit means coupled to said photosensitive detector for generating an error signal at an output thereof responsive to said illumination signal deviating outside an acceptable illumination range defined between an upper illumination limit and a lower illumination limit;

clock means for generating a periodic clock signal; and

shift register means operatively coupled to said clock means, to said output of said illumination limit means and to each of said power controllers, with said shift register means for generating, responsive to receiving said clock signal and said error signal, appropriate ones of said power control signals so as to change the illumination of selected ones of the lighting modules, thereby adjusting the total illumination level to be within said acceptable illumination range.

4,233,546

STROBOSCOPIC BEACONS FED FROM A CAPACITIVE SOURCE

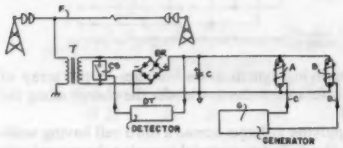
Raymond Berthiaume, Ste-Julie, Canada, assignor to Hydro-Quebec, Quebec, Canada

Filed Sep. 18, 1978, Ser. No. 943,476

Claims priority, application Canada, Apr. 26, 1978, 302066

Int. Cl.[2] H05B *41/34*

U.S. Cl. 315—241 R **15 Claims**



1. A system for feeding flash-tubes of beacons with the capacitive energy extracted from an insulated section of an overhead wire of an AC power transmission line, comprising:

means for transforming said capacitive energy from the overhead wire into a DC voltage to feed at least one of said flash tubes;

regulation means coupled in shunt to said transforming means for controlling the DC voltage supply to said flash-tubes, regulation means comprising a switching circuit for relating said DC voltage according to a predetermined value and a detection circuit operative to control actuation of said switching circuit when said predetermined DC voltage value is reached; and

means for generating at a predetermined frequency pulses for firing said at least one flash-tube when said flash-tube is under said DC voltage regulated by said regulation means.

4,233,547

COLOR TELEVISION DISPLAY DEVICE COMPRISING A DEFLECTION COIL UNIT PROVIDED WITH A DEFLECTION COIL FOR THE VERTICAL DEFLECTION AND DEFLECTION COIL UNIT FOR SUCH A DISPLAY DEVICE

Jan Gerritsen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

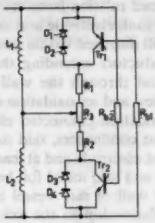
Filed Jun. 25, 1979, Ser. No. 51,596

Claims priority, application Netherlands, Jul. 31, 1978, 7808044

Int. Cl.[3] H01J *29/70, 29/76*

U.S. Cl. 315—368 **10 Claims**

1. A color television display device comprising a color picture display tube and a deflection coil unit provided with a deflection coil for deflecting into the vertical direction the electron beams generated in the display tube, the coil being divided into two series-interconnected coil halves and being connected to a deflection current generator for generating a sawtooth deflection current flowing in operation through the deflection coil halves and having a trace and a retrace which reverses its direction at approximately tl. center instant of the trace period and further provided with an adjustable balancing resistor in a parallel branch which produces a correction circuit which flows through the deflection coil halves, wherein said device further comprises means for decreasing, during the trace period of the deflection current, the voltage present in operation across the parallel branch including said balancing



resistor by a constant voltage in such a way that the voltage across said parallel branch is more decreased after said center instant than before and that the correction current at and about said center instant is substantially zero.

4,233,548

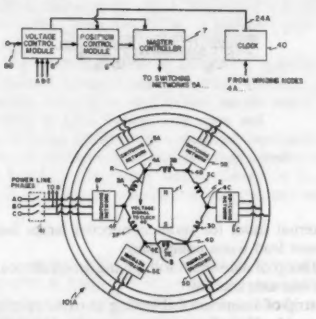
VARIABLE SPEED ELECTRONIC MOTOR

James L. Kirtley, Jr., Brookline, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Apr. 20, 1978, Ser. No. 898,264

Int. Cl.[3] H02K *29/02;* H02P *5/16*

U.S. Cl. 318—138 **23 Claims**



1. A variable speed electronic motor for connection to a power source that comprises, in combination: a rotor; an armature winding; semiconductor switching means to connect between the power source and the armature winding, the semiconductor switching means comprising semiconductor switches connected in pairs in which one semiconductor switch of each pair is operable to carry current to the winding and the other semiconductor switch of each pair is operable to carry current from the winding; position control module means to provide a position control signal; voltage control module means to provide a voltage control signal; and control means connected to control the semiconductor switching means, said control means comprising an electrical gating module connected to control each semiconductor switch of each pair, each gating module including a logic gate and signal transfer means connected to transfer control information to the associated semiconductor switch from the logic gate, the logic gate being connected to receive the position control signal and the voltage control signal and being operable to combine the two signals to form a composite signal output that is fed as a control signal to said associated semiconductor switch to control the speed of the motor and the amount of electric energy transferred thereto said logic gate being a gate that provides said composite signal output only when both the position

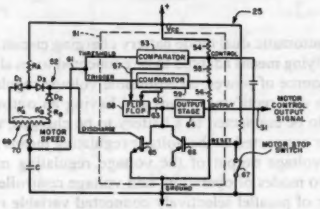
control signal and the voltage control signal are present as inputs to the logic gate.

4,233,549

SPEED AND TORQUE CONTROL FOR FRACTIONAL HORSEPOWER MOTORS

Kamalakar D. Dighe, Laurel, Md., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Dec. 8, 1978, Ser. No. 967,862
Int. Cl.³ H02P *5/16*
U.S. Cl. 318—317 **5 Claims**



1. A motor speed control system for supplying power from an electrical power source to an electric motor, comprising, in combination:

a capacitor having one terminal connected to a plane of reference potential;

a source of unidirectional current of relatively constant voltage;

means including a capacitor charge circuit serially comprising a first resistor, a first diode, and a second resistor connected between said current source and the remaining terminal of said capacitor, for periodically charging said capacitor;

means including a capacitor discharge circuit serially comprising a third resistor, a fourth resistor, and a second diode connected between the remaining terminal of said capacitor and said plane of reference potential for periodically discharging said capacitor;

timing circuit means serially included in said capacitor discharge circuit between said second diode and said plane of reference potential, and including a voltage capacitor responsive to the voltage level across said capacitor for periodically rendering said discharge circuit operative to discharge said capacitor;

electronic switch means serially connected between the electrical power source and the electric motor and responsive to said timing circuit for applying pulses to said motor having a repetition rate and duty cycle dependent on the charging and discharging of said capacitor;

means including a diode connected between the juncture of said first resistor and said first diode, and the juncture of said second diode and said timing circuit for disabling said capacitor charge circuit upon operation of said capacitor discharge circuit; and

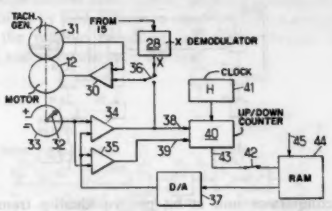
said second and third resistors comprising respective sections of a potentiometer having a user-adjustable tap connected to said capacitor whereby the duty cycle of the pulses applied to said electric motor are varied without varying the frequency thereof for smooth speed control of the motor over a wide range of speeds.

4,233,550

NUMERICALLY CONTROLLED MACHINE TOOLS PARTICULARLY STITCHING OR PRICKING MACHINES

Henri Berger, Triel sur Seine, France, assignor to Societe d'Applications Generales d'Electricite et de Mechanique (SAGEM), Paris, France

Filed Jul. 26, 1978, Ser. No. 928,019
Claims priority, application France, Jul. 29, 1977, 77 23477
Int. Cl.³ G05B *19/10*
U.S. Cl. 318—568 **6 Claims**



1. In a numerically controlled machine tool for storing a digital record of a pattern and effecting a mechanical operation on work pieces according to the stored pattern, the combination of:

a work piece support table,

a head carrying a tool for carrying out said mechanical operation,

first and second drive means for effecting relative movement of said table and head along a first and a second coordinate axes, respectively,

first and second transducer means for providing electrical signals representative of the amount of movement of said first and second drive means, respectively,

an optical follower carried by said head in an invariable position with respect to said tool, said follower being constructed for receiving the image of said pattern as represented by a linear drawing and for automatically controlling said first and second drive means for said follower to follow said pattern,

digital memory means,

analog digital conversion means for conversion of analog electrical signals into or from digital signals storable in said memory means,

and switch means having a first and a second condition, which, in one condition, route the signals from said transducer means to said conversion means and memory means for digital storage of the pattern followed by said optical follower and, in the other condition, cause control of the drive means by the signals stored in digital form in the memory means through said transducer means and conversion means, whereby the linearity defects of said transducer means and conversion means are compensated.

4,233,551

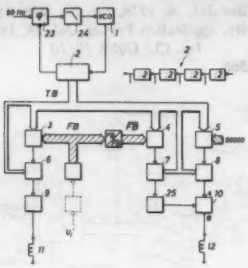
CONTROL CIRCUIT FOR AN A.C. MOTOR

Axel Jensen, Bjerringbro, and Niels Molgaard, Silkeborg, both of Denmark, assignors to Grundfos A/S, Bjerringbro, Denmark

Filed Jun. 1, 1978, Ser. No. 911,511
Claims priority, application Denmark, Jun. 3, 1977, 2465/77
Int. Cl.³ H02P *5/28*
U.S. Cl. 318—809 **4 Claims**

1. A control circuit for an A.C. motor with at least two sets of windings, and having a device controlling the power supply to the windings, comprising: a dividing circuit with a counter connected to a source of voltage through a voltage-controlled oscillator and transmitting a bit pattern corresponding to the instantaneous phase of the voltage of said source, the bit pattern corresponding to the maximum counting corresponds to

90°, binary comparator units receiving the bit pattern through a data bus for comparison with both a preselected phase in the form of a bit pattern and a bit pattern corresponding to a phase symmetrical with respect to the maximum value of the voltage, control means and trigger circuit therefor, said second bit pattern being the complement to the preselected bit pattern,



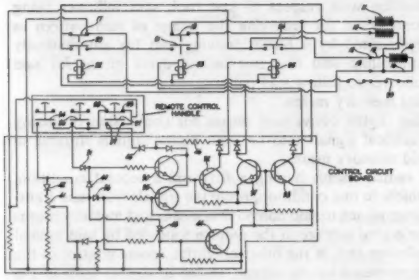
each comparator unit at bit pattern identity transmitting a signal for said trigger circuit for said control means, said control means controlling power supply for individual windings, and a switch-off circuit, one of said control means stopping the power supply to a winding before the zero cross-over of the voltage of said source by said switch-off circuit.

4,233,552

VEHICLE-STARTING CIRCUIT WITH EXCESSIVE VOLTAGE DETECTION

Dale M. Baumbach, Sugar Land, Tex., assignor to Associated Equipment Corporation, St. Louis, Mo.

Filed Jun. 28, 1978, Ser. No. 920,003
Int. Cl.³ H02J *7/00*
U.S. Cl. 320—7 **8 Claims**



1. A vehicle-starting circuit with excessive voltage detection, comprising:

(a) a pair of starting batteries, and a stalled vehicle battery,

(b) a battery switch means including:

1. a first battery switch means normally connecting the starting batteries in parallel, and

2. a second battery switch means operatively connecting or disconnecting the starting batteries to the stalled vehicle battery,

(c) a first control means for actuating the second battery switch means, and connected to the second battery switch means for connecting the starting batteries in parallel to the stalled vehicle battery,

(d) a second control means connected to the first battery switch means for actuating the first battery switch means to one position for series connection when the second control means is "on" and for allowing the first battery switch means to return to normal position for parallel connection when the second control means is "off," and

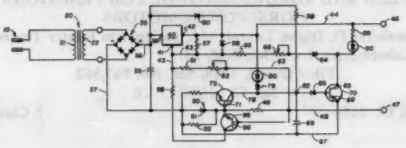
(e) voltage-detecting means connected to the starting batteries and the second control means for turning the second control means "off," if actuated.

4,233,553

AUTOMATIC DUAL MODE BATTERY CHARGER

Luther T. Prince, Jr., Minneapolis; Wilbur J. Hampel, Spring Park, and Michael A. Boot, Minneapolis, all of Minn., assignors to Ault, Inc., Minneapolis, Minn.

Filed May 10, 1978, Ser. No. 904,517
Int. Cl.³ H02J *7/04*
U.S. Cl. 320—23 **9 Claims**



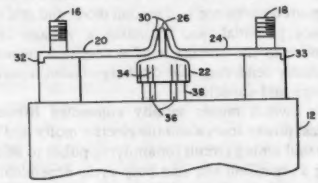
1. An automatic dual mode battery charging circuit comprising, rectifying means adapted to be connected to an alternating current source of power, an adjustable voltage regulator connected to said rectifying means and having an output circuit adapted to be connected to a battery to be charged; a voltage controller connected to the voltage regulating means to set the level of voltage output of the voltage regulating means between two modes of operation, said voltage controller including a pair of parallel selectively connected variable resistance circuits, each of which has a separate adjustable resistor to adjust the current output of the voltage regulator for each of the two modes of operation, each circuit of which is connected to an input of the voltage regulator; and current detector means connected between the rectifying means and the battery and sensing charging current flowing through the battery, said current detector means being connected to the voltage controller to change the operation of the voltage regulating means between the two modes of operation.

4,233,554

VENT ACTUATED SHORTING SWITCH

James N. Ellis, Chatsworth, Calif., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 5, 1979, Ser. No. 27,203
Int. Cl.³ H02J *7/00;* **H01H** *35/38*
U.S. Cl. 320—46 **2 Claims**



1. A vent actuated shorting switch comprising: a container having a pressure release opening therein and first and second electrical terminals thereon, first and second electrical conductive extensions projecting from respective of said first and second electrical terminals, respective projecting ends of said extensions being adjacent and positioned above said pressure release opening, a cap moveably disposed and covering said pressure release opening for moving toward and repositioning adjacent said projecting ends of said conductor extensions in response to excessive pressure within said container being

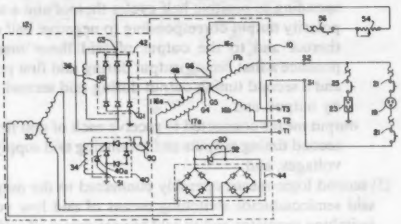
released and an electrical conductor fixedly attached to said cap for contacting said conductive extensions and providing electrical connection therebetween in response to said repositioning of said cap adjacent said extensions, said pressure release opening being defined by a protruding neck, said neck having a plurality of ridges on the outer surface thereof, and said cap being slidably disposed on said neck and having a plurality of grooves on the inside thereof for guiding the direction of sliding movement of said cap toward said extensions.

4,233,555

ALTERNATING CURRENT GENERATOR FOR PROVIDING THREE PHASE AND SINGLE PHASE POWER AT DIFFERENT RESPECTIVE VOLTAGES

Lawrence R. Roche, Le Center, Minn., assignor to Dyna Technology, Inc., Minneapolis, Minn.

Filed Apr. 5, 1979, Ser. No. 27,409
Int. Cl.³ H02P 9/10
U.S. Cl. 322—25 **15 Claims**



1. A brushless dynamo electric machine for generating single phase and three phase alternating current output power at a substantially constant voltage level without requiring a voltage regulator, comprising:

a generator with a stator having a single phase and a three phase winding and a rotor having a field winding;

an exciter including a rotor winding, a control field winding and a compounding field winding;

first circuit means including first rectifier means for energizing said control field winding of the exciter responsive to the voltage of said three phase generator stator winding;

second circuit means including second rectifier means connected in series with said generator stator windings and the load on said generator for energizing said compounding field winding of the exciter in proportion to the amplitude of current in said generator stator winding;

rotary rectifier means connected to energize said rotor field winding with a D.C. voltage related to the A.C. voltage of said exciter rotor winding; and

means for adjusting the degree of energization of said exciter compounding field winding by said second circuit means in dependence upon whether the single phase or three phase alternating current output signal is being supplied to the load on said generator.

4,233,556

VOLTAGE REGULATOR, PARTICULARLY FOR AUTOMOTIVE USE

Karl Nagel, Gemaringen, Fed. Rep. of Germany, and Gerhard Conzelmann, Leinfelden-Echterdingen, Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 23, 1978, Ser. No. 936,026
Claims priority, application Fed. Rep. of Germany, Aug. 29, 1977, 2738897
Int. Cl.³ H02P 9/30
U.S. Cl. 322—28 **20 Claims**

1. Voltage regulator, particularly for automotive use, for a dynamo electric generator (A) adapted for operation under variable speed conditions and for connection to a field winding (23) of the generator (A) and control of the energization thereof, comprising

means (C,12) connected to the generator (A) and furnishing an instantaneous voltage signal representative of the output voltage of the generator:

a reference source (R,40) providing a reference voltage;

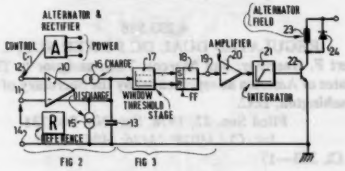
a differential amplifier (10) having the instantaneous voltage signal and the reference voltage connected thereto;

a capacitor (13);

means (16, 35) supplying a charge current to the capacitor;

means (15) draining discharge current from the capacitor;

said capacitor charge current supply means (16, 35) and discharge current drain means (15) being connected to and controlled by said difference amplifier (10) in accordance with the relative values of said instantaneous voltage signal and said reference voltage;



a high-and-low discriminator (17) connected to and controlled by the voltage across said capacitor;

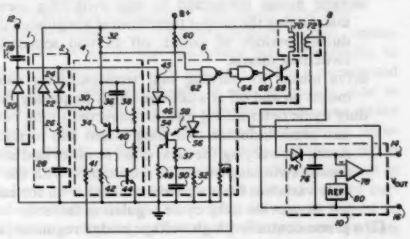
and means (19, 20, 21, 22) controlling current flow to the field (23) of the dynamo electric generator under control of the output of the discriminator with respect to the relationship of the voltage across the capacitor to threshold levels of the discriminator by controlling the flow of current, or interruption of current, in accordance with the respective voltage levels across the capacitor and the high-and-low response levels of the discriminator, said capacitor (13) thereby simultaneously filtering or smoothing the control operation of the regulator while establishing the voltage levels controlling change-over of response of the discriminator.

4,233,557

SWITCHING POWER SUPPLY

Jade H. Alberkrack, Chandler, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 12, 1979, Ser. No. 74,833
Int. Cl.³ G05F 1/58
U.S. Cl. 323—9 **9 Claims**



1. A switching type power supply for receiving a fixed frequency pulse train at its input and generating therefrom an output voltage, comprising:

first means having a variable resistance for differentiating said fixed frequency pulse train to produce a differentiated pulse train;

a Schmidt NAND gate having first and second inputs and an

output, said first input coupled to said first means for receiving said differentiated pulse train;

switching means coupled to the output of said NAND gate;

a transformer having primary and secondary windings, said primary winding coupled to said switching means and inducing a voltage across said secondary winding;

second means coupled to said secondary winding for generating said output voltage;

a source of a reference voltage;

third means for comparing said reference voltage with said output voltage and for generating a signal indicative of the difference therebetween;

fourth means coupled to said first means and said third means and responsive to said signal for varying the resistance of said first means; and

fifth means coupled to said switching means and to the second input of said NAND gate for controlling passage of said differentiated pulse train through said NAND gate.

4,233,558

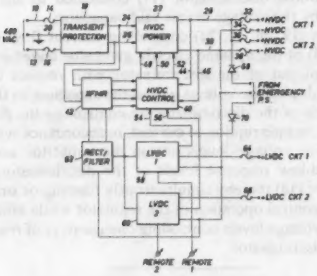
REGULATED DUAL DC POWER SUPPLY

Robert F. Gaertner, San Marcos, Tex., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 22, 1978, Ser. No. 944,731

Int. Cl.³ H02P *13/26*; H05F *1/64*

U.S. Cl. 323—17 **9 Claims**



1. A power supply for providing both regulated low voltage dc and regulated high voltage dc from a common high voltage ac source, comprising

(1) at least one low voltage switching regulator, including

a rectifier connected to the ac source voltage to produce a low unregulated dc voltage,

semiconductor switching means connected to said rectifier to produce a switched output therefrom,

storage means connected to said switching means for maintaining the output therefrom at a regulated dc level during periods of switch off of said semiconductor switching means,

drive means for turning said semiconductor switching means on and off at a constant high frequency rate, and

duty cycle determining means connected to the output of said semiconductor switching means and to said drive means for varying the ratio of on to off of said semiconductor switching means in accordance with the amplitude variation from a predetermined level for said output to provide duty cycle regulation thereof;

(2) a phase-controlled high voltage bridge regulator, including

a high voltage rectifying bridge network having power switching semiconductors in at least two legs thereof, the phase timing of supply gate voltages to said semiconductors with respect to the occurrence of the cycles in the ac source determining the dc output from said bridge network,

control means for producing respective gate voltages to said power switching semiconductors during alternate half cycles of the ac source voltage, said control means comprising

means for sampling a portion of the high voltage dc to be regulated and developing an error voltage that said portion of the high voltage deviates from a predetermined value,

trigger means connected to the ac source voltage for creating a trigger voltage with the occurrence of each half cycle thereof,

timer means connected to said trigger means producing an output following the occurrence of a trigger from said trigger means,

a controllable time constant network connected to said timer means and to said sampling means for creating a threshold voltage to said timer means at a time dependent on the amplitude of said error voltage,

first logic means operably connected to the ac source voltage for producing a first polarity output corresponding to positive half cycles thereof and a second polarity output corresponding to negative half cycles thereof and to the output of said timer means to produce a first timing output during said first polarity and a second timing output during said second polarity output, and

output means connected to receive each of said first and second timing outputs and producing said supply gate voltages; and

(3) second logic means operably connected to the output of said semiconductor switching means of said low voltage switching regulator and to said trigger means of said high voltage regulator to inhibit said trigger voltage therefrom when the output from said semiconductor switching means is below a predetermined level and hence to inhibit the output from said high voltage regulator until there is an output from said low voltage regulator larger than a predetermined minimum level.

4,233,559

QUICKLY PERFORMED MEASURING METHOD FOR ASCERTAINING THE CONCENTRATION OF THE POLAR COMPONENTS IN A MATERIAL OTHERWISE MAINLY NON-POLAR

Heinz Hoberg, Aachen-Laurensberg, and Albert Klein, Walhorn-Belgien, both of Fed. Rep. of Germany, assignors to Bergwerksverband GmbH, Essen, Fed. Rep. of Germany

Filed Feb. 28, 1979, Ser. No. 16,063

Claims priority, application Fed. Rep. of Germany, Mar. 1, 1978, 2808739

Int. Cl.³ G01R *27/04*

U.S. Cl. 324—58.5 A **16 Claims**

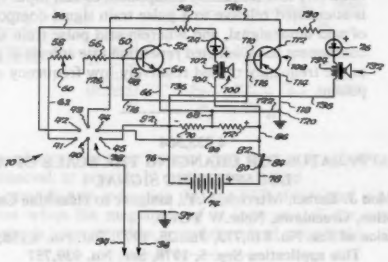
1. In a method of ascertaining the concentration of a polar component of an otherwise non-polar or negligibly polar material, the step of using a microwave waveguide to transmit electromagnetic waves through a sample of the material and measuring the transmission delay of the thusly transmitted electromagnetic waves, the frequency of the electromagnetic waves not exceeding a predetermined upper limit, the upper limit being the lower one of two frequencies, one frequency being the frequency at which the dielectric constant of the polar component exceeds that of the remaining, non-polar or negligibly polar component of the material, the other frequency being the dipole-relaxation frequency f_0 of the polar component, wherein $f_o=\frac{1}{2\pi\tau,\tau}$ being the dipole-relaxation time-constant of the polar component.

4,233,560

ELECTRICAL APPARATUS FOR TESTING VOLTAGE, POLARITY AND CONTINUITY

Orman L. Blenman, 69 Drexel Rd., Buffalo, N.Y. 14214

Filed Aug. 24, 1978, Ser. No. 936,351
Int. Cl.[3] G01R *19/14, 31/02*
U.S. Cl. 324—133 8 Claims



1. Apparatus for testing electrical voltage and polarity comprising:

(a) a pair of input probe terminals adapted to be connected to two points having a voltage therebetween to be tested, one of said terminals being connected to an electrical ground or reference of said apparatus;

(b) a source of direct voltage having a reference terminal connected to said ground or reference of said apparatus, a relatively positive terminal and a relatively negative terminal;

(c) an NPN transistor having base, collector and emitter terminals, said emitter terminals being connected to said reference terminal of said source;

(d) first visual indicating means comprising a light-emitting diode having an anode and a cathode, means for connecting said cathode to said collector of said NPN transistor and means for connecting said anode to said relatively positive source terminal;

(e) a PNP transistor having base, collector and emitter terminals, said emitter terminal being connected to said reference terminal of said source;

(f) second visual indicating means comprising a light-emitting diode having an anode and a cathode, means for connecting said anode to said collector of said PNP transistor and means for connecting said cathode to said relatively negative source terminal; and

(g) means for connecting the other of said input probe terminals to each of said bases of said NPN and PNP transistors comprising variable resistance means connected between said other input terminal and said base terminals of said transistors for varying the range of magnitudes of voltage which can be tested;

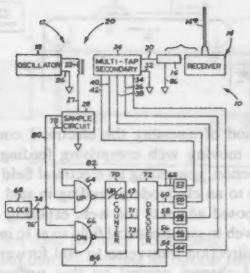
(h) whereby said apparatus distinguishes between an alternating voltage and a direct voltage across said probe input terminals with both of said light-emitting diodes being energized if said voltage is alternating and with only one of said light-emitting diodes being energized if said voltage is direct, the particular one determined by the polarity of the direct voltage.

4,233,561

AUTOMATIC IMPEDANCE MATCHING CONDUIT LOCATOR

Merrill K. Haddon, 13545 SW. Village Glenn, Tigard, Oreg. 97223, and Clifford H. Moulton, 4175 SW. Dogwood La., Portland, Oreg. 97225

Continuation of Ser. No. 814,151, Jul. 11, 1977, abandoned. This application Dec. 7, 1978, Ser. No. 967,294
Int. Cl.[3] G01V *3/08;* G05F *1/24;* H03H *7/38*
U.S. Cl. 324—326 2 Claims



1. In apparatus for coupling an electrical search signal to a concealed electrically conductive element for the purpose of assisting in locating the same

a pair of output terminals operatively connectable to such an element,

electrical signal-producing means including transformer means having primary and secondary sides, with said primary side being operatively connected to a signal generator and with said secondary side being operatively connected to said terminals for supplying a search signal thereto,

current-monitoring means operatively connected to said primary side for monitoring the level of primary-side current, said current monitoring means including filter circuit means constructed to allow such monitoring only of currents having a frequency substantially the same as the fundamental frequency of said signal generator,

changeable-condition impedance-adjusting means operatively connected to said secondary side, changeable to adjust, to different selected amounts within a preselected range, the output impedance of said secondary side as coupled to said terminals, said impedance-adjusting means including, for defining said range and said selected impedance amounts, a digital bidirectionally gatable up/down counter which is gated in response to selected changes in the level of primary-side current monitored by said current-monitoring means, with different counts stored in said counter effecting different output impedance amounts within said range, and

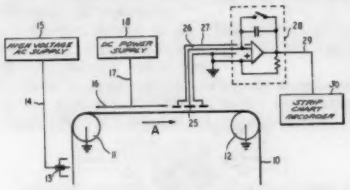
means operatively interconnecting said current-monitoring means and said counter, whereby the level of monitored primary-side current is effective to change the count stored within said counter so as to produce an output impedance amount within said preselected range which accommodates maximum output-current flow from said secondary side through said terminals.

4,233,562

APPARATUS AND METHOD FOR MONITORING WEB CONDUCTIVITY

Anthony R. Blythe, Welwyn, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Mar. 7, 1979, Ser. No. 18,244
Claims priority, application United Kingdom, Nov. 8, 1978, 43733/78
Int. Cl.³ G01N 27/60
U.S. Cl. 324—455 10 Claims



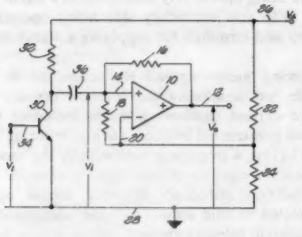
1. A method of assessing the electrical conductivity of a surface of a moving web comprising feeding the web in a forward direction, generating an electrical field by supplying a high voltage to an electrode extending in said forward direction and disposed adjacent the web, exposing said surface of the moving web to said electrical field so as to induce a redistribution, in a direction transverse to said forward direction, of the electrical charges present on that surface, whereby an electrical field signal is generated by the redistributed surface charges of opposite polarity to that of the electrode, and monitoring said electrical field signal.

4,233,563

FREQUENCY SELECTIVE HYSTERESIS COMPARATOR

William A. Schanbacher, 347 S. Glasgow, Inglewood, Calif. 90301

Filed Sep. 6, 1978, Ser. No. 940,072
Int. Cl.³ H03K 9/06, 9/08, 5/08
U.S. Cl. 328—138 5 Claims



1. A circuit, comprising:

(a) hysteresis comparator means for wave shaping a pulse train signal wherein the hystersis loop transfer function of said comparator means has an input comparison region of a selected width whereby any signal driving said comparator and having a peak-to-peak amplitude less than said selected width of said input comparison region is not transmitted by said comparator, wherein said hysteresis comparator means comprises:

(1) a high gain differential amplifier having inverting input means, non-inverting input means, and output means;

(2) positive feedback resistor means coupled between said output means and said non-inverting input means;

(3) input resistor means coupled between said non-inverting input means and said inverting input means; and

(4) voltage divider means for providing a bias voltage to said inverting input means;

(b) means for applying an input signal to said comparator; and

(c) a differentiating network connected between said means for applying an input signal to said comparator and an input circuit for said comparator, wherein said differentiating network comprises:

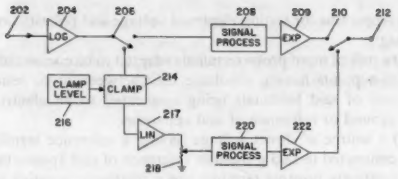
(1) a capacitor coupled in series between said means for applying an input signal and said input circuit for said comparator, wherein said capacitor has a capacitance selected to cause said input circuit to function as a passive element differentiating network, wherein a relatively low frequency component of said input signal is attenuated relative to a pulse train signal component of said input signal, and wherein said pulse train signal component has a selected repetition rate at least as great as the frequency of said relatively low frequency component.

4,233,564

APPARATUS FOR CHANGING THE SCALE OF A LOGARITHMIC SIGNAL

Sheldon J. Kerbel, Merrick, N.Y., assignor to Hazeltine Corporation, Greenlawn, Nebr.W YORK

Division of Ser. No. 818,773, Jul. 25, 1977, Pat. No. 4,158,859.
This application Sep. 5, 1978, Ser. No. 939,757
Int. Cl.³ H03K 5/08; G06G 7/24
U.S. Cl. 328—145 3 Claims



1. Apparatus for modifying the scale of a supplied logarithmic signal having a reference level, comprising:

means for generating a clamping signal having a selected voltage level;

a clamping circuit for clamping the level of said logarithmic signal to the level of said clamping signal;

and means for linearly modifying the amplitude of said clamped logarithmic signal thereby to generate an output logarithmic signal having a different logarithmic scale than said supplied logarithmic signal.

4,233,565

METHOD AND APPARATUS FOR A PSK SIGNAL DETECTOR

Stanley J. Chmura, Elmhurst, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 920,439, Jun. 29, 1978, abandoned.
This application Jun. 29, 1979, Ser. No. 53,494
Int. Cl.³ H04L 27/22
U.S. Cl. 329—50 15 Claims

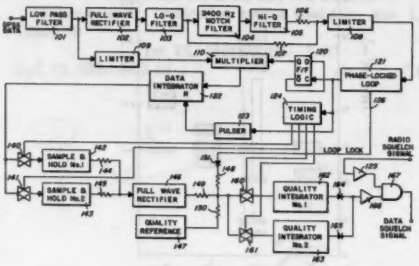
4. A method for detecting the presence of a phase-shift-keyed (PSK) data signal serially transmitted by a data clock signal having a predetermined bit frequency, and encoded on a carrier signal having a predetermined carrier frequency, wherein N half-cycle intervals of the carrier signal are provided for each data bit, said method comprising the steps of:

(a) recovering the carrier signal from the PSK data signal;

(b) cross-correlating the carrier signal and PSK data signal over each of the N half-cycle intervals to provide corresponding correlation signals;

(c) combining the N consecutive correlation signals and a reference signal to provide a combined signal for each data bit interval;

(d) integrating the combined signal during successive half-cycle intervals separated by one data bit interval, for a



predetermined time interval that is at most a half-cycle interval, to provide N quality signals; and

(e) providing an indication that the PSK data signal is present when the magnitude of at least one of the quality signals is greater than a predetermined magnitude.

4,233,566

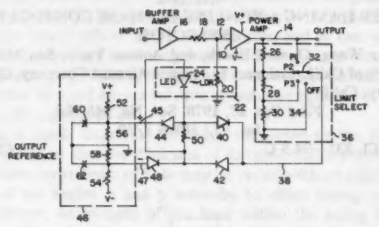
DISTORTION FREE POWER LIMITING AND CLIPPING PREVENTION CIRCUIT

Mioljub Nestorovic, Edmonds, Wash., assignor to Technical Audio Products Corporation, Redmond, Wash.

Filed Oct. 23, 1978, Ser. No. 953,754

Int. Cl.[3] H03F *17/00;* H03G *3/20*

U.S. Cl. 330—59 **13 Claims**



1. In an amplifier for increasing the amplitude of an input signal in order to generate a relatively high amplitude output signal, said amplifier being powered by a DC power supply generating a DC supply voltage from an AC power input in which the magnitude of said supply voltage may vary to some extent responsive to variations in the voltage of said power input and the magnitude of said output signal in order to establish a clipping level for said amplifier, a circuit for limiting the level of said output signal to an output level which is a function of the magnitude of said supply voltage, comprising:

a voltage controlled attenuator connected to the input of said amplifier for reducing the amplitude of the input signal responsive to an attenuator control signal;

reference means for providing a preselected output reference which is a function of the magnitude of said supply voltage and of the clipping level of said amplifier such that said output reference corresponds to the maximum voltage of said output signal which varies in accordance with the variation of the supply voltage for said amplifier; and

comparator means receiving the output of said amplifier and said output reference for generating said control signal responsive to a predetermined percentage of said output signal reaching said output reference as said output signal approaches said clipping level whereby said amplifier may produce the maximum available power without clipping as the maximum available power varies.

4,233,567

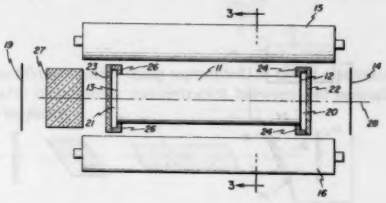
FACE-COOLED LASER DEVICE HAVING INCREASED ENERGY STORAGE AND OUTPUT

Joseph P. Chernoch, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 818,725, Jul. 25, 1977, abandoned. This application Dec. 13, 1978, Ser. No. 969,045

Int. Cl.[2] H01S *3/045*

U.S. Cl. 331—94.5 P **27 Claims**



1. A face-cooled solid rod laser comprising:

a pair of aligned mirrors defining an optical resonant cavity therebetween;

a rod of optically active laser material disposed within said cavity and optically aligned with said mirrors and adapted, when irradiated with optical pumping radiation, to emit coherent radiation at a predetermined optical wavelength, said rod having a longitudinal axis and opposite end faces that are substantially parallel so as to permit passage of radiation along said axis;

means for optically pumping said rod situated alongside at least a portion of the longitudinal surface of said rod; and

means for maintaining said end faces at a predetermined temperature differential to establish a thermal gradient parallel to said longitudinal axis.

4,233,568

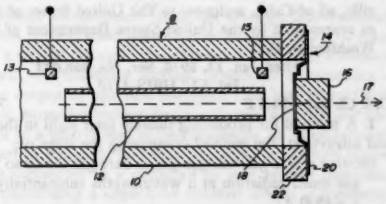
LASER TUBE MIRROR ASSEMBLY

Randolph W. Hamerdinger, and Robert C. McQuillan, both of Glendora, Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Feb. 24, 1975, Ser. No. 552,396

Int. Cl.[2] H01S *3/08*

U.S. Cl. 331—94.5 D **30 Claims**



1. An internal mirror type laser tube having an active medium contained in an elongated envelope and means for mounting a mirror to each end of the envelope, said mounting means comprising a metal member having an aperture formed therein, a mirror comprising a glass substrate having a reflecting layer formed on one surface thereof, and bonding means comprising a glass solder for bonding said glass substrate to said metal member in a manner whereby said reflecting layer is aligned

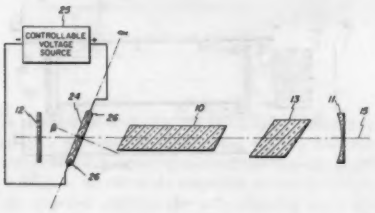
with said aperture, the glass substrate, bonding means and the metal member having co-efficients of thermal expansion which are substantially equal.

4,233,569

HIGH POWER LASER WITH TUNING AND LINE NARROWING CAPABILITY

Yung S. Liu, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 19, 1976, Ser. No. 668,605
Int. Cl.[2] H01S 3/10
U.S. Cl. 331—94.5 C **21 Claims**



1. A high power, Q-switched, tunable laser comprising:
an optically-resonant cavity having reflector means at either end thereof;
an active medium comprising neodymium-doped glass disposed within said cavity so as to emit optical energy in a direction normal to the reflecting surface of each of said reflector means;
an electro-optical phase-shifting cell disposed within the cavity in the path of the emitted optical energy; and
a birefringent filter situated within the cavity and having at least one face substantially at the Brewster angle with respect to the path of optical energy emitted from the active medium, said birefringent filter having refractive indices along mutually perpendicular α, β and γ directions and being cut with its β axis normal to said one face and being rotatable about said β axis.

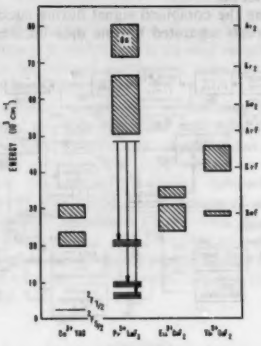
4,233,570

TUNABLE, RARE EARTH-DOPED SOLID STATE LASERS

John L. Emmett, Pleasanton; Ralph R. Jacobs, Livermore; William F. Krupke, Pleasanton, and Marvin J. Weber, Danville, all of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 11, 1978, Ser. No. 868,633
Int. Cl.[3] H01S 3/16
U.S. Cl. 331—94.5 F **7 Claims**

1. A method for producing tunable laser light in the visible and ultraviolet, the method comprising the steps of:
exciting a rare gas-halogen gas or rare gas dimer so that the gas emits radiation at a wavelengths substantially below $\lambda = 4500$ A;
directing a portion of the emitted radiation to a solid matrix which is doped by rare earth ion in a fraction 0.1–2.0% numerical density;
causing a substantial number of rare earth ions in the dopant to be excited into a 5d spectroscopic level of the ions by absorption of the emitted radiation;
allowing the excited rare earth ions to decay non-radiatively to an energy level substantially at the lower end of the 5d band that has a radiative lifetime exceeding 65 nsec.;
allowing the excited rare earth ion to decay radiatively from its position substantially at the lower end of the 5d absorption band, with the emission radiation at a wavelength in the wavelength region 1700 A $< \lambda <$ 5200 A.

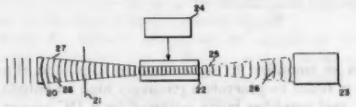


4,233,571

LASER HAVING A NONLINEAR PHASE CONJUGATING REFLECTOR

Victor Wang, Oxnard Beach, and Amnon Yariv, San Marino, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Sep. 27, 1978, Ser. No. 945,986
Int. Cl.[3] H01S 3/10
U.S. Cl. 331—94.5 C **9 Claims**



1. A laser, comprising:
a nonlinear phase conjugate reflecting means for providing light which is the phase conjugate of light incident thereupon;
partially transmissive reflecting means for transmitting a portion and reflecting a portion of the light incident thereupon;
a lasing medium disposed between said partially transmissive reflecting means and said nonlinear phase conjugate reflecting means, the combination thereof forming a laser resonator;
excitation means coupled to said lasing medium for exciting said laser medium and inducing laser operation; and
an aperture stop configured and disposed within said laser resonator adjacent to said partially transmissive reflecting means so as to create a reference for the phase conjugating process and restrict laser operation to a single lasing mode irrespective of phase aberrations within said laser resonator.

4,233,572
DYE LASER TUNER

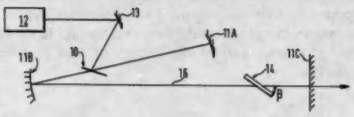
Eugene G. Arthurs, Killearn, By Glasgow, and Anthony F. Purdie, Glasgow, both of Scotland, assignors to Barr & Stroud Limited, Glasgow, Scotland

Filed Nov. 16, 1978, Ser. No. 962,570

Claims priority, application United Kingdom, Apr. 1, 1978, 12840/78

Int. Cl.³ H01S *3/081, 3/10*

U.S. Cl. 331—94.5 M **7 Claims**



1. A laser including a lasing medium which lases over a relatively wide band of wavelengths,

means effecting strong linear polarisation in one plane of the intracavity light beam,

and means of tuning the output wavelength of the laser, said tuning means comprising a wedged plate made of birefringent material located to intercept the beam of intracavity light, said plate having its incident surface oriented with respect to the incident light beam such that within the plate at the point of incidence the projection onto the plane normal to the light beam path of the normal from the incident plate surface is at an angle ϕ, substantially equal to an odd multiple of 45°, to the projection of the optic axis of the plate onto said plane and, the nominal plate thickness and the angle γ between the light beam path within the plate and the optic axis of the plate are such that the free spectral range of the plate is greater than the bandwidth of lasing wavelengths, and at one wavelength within the lasing bandwidth the components of incident-light along the fast and slow axes of the birefringent material have a relative retardation equal to an integral multiple of 2π,

and a linear translator drivingly connected to the tuning means so that the thickness of the plate traversed by the intracavity beam of light may be varied without alteration of the angles ϕ and γ whereby to effect tuning of the output wavelength of the laser within the lasing bandwidth.

4,233,573
CARRIER CONCENTRATION CONTROLLED SURFACE ACOUSTIC WAVE VARIABLE DELAY DEVICES

Thomas W. Grudkowski, Glastonbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Feb. 12, 1979, Ser. No. 11,612

Int. Cl.³ H01L *41/04;* H03B *5/32;* H03H *9/25, 9/42*

U.S. Cl. 331—107 A **6 Claims**

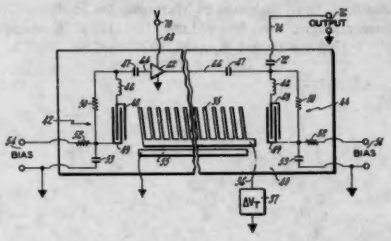
1. An improved surface acoustic wave variable delay line comprising:

a piezoelectric and semiconductive substrate;

a rectifying contact disposed on a surface of said substrate;

a pair of acoustoelectric transducers disposed on said substrate at opposite ends of said contact for launching and detecting piezoelectric surface acoustic waves in said substrate beneath and contact at frequencies within a design range of frequencies;

a source of variable voltage connected to said contact for altering the concentration of carriers in said substrate, whereby variations in said voltage alter the potential and velocity of the surface acoustic wave in said substrate; in which the improvement comprises:



said rectifying contact being segmented, to thereby provide control over carrier concentration between and beneath the segments.

4,233,574
OSCILLATION CIRCUIT

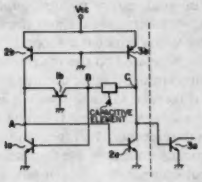
Kenji Kaneko, Hachioji, and Takahiro Okabe, Hinodemachi, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Jul. 6, 1978, Ser. No. 922,370

Claims priority, application Japan, Jul. 15, 1977, 52-84278; Mar. 24, 1978, 53-33051; May 19, 1978, 53-66547[U]

Int. Cl.³ H03B *5/36;* H03K *3/282*

U.S. Cl. 331—108 D **14 Claims**



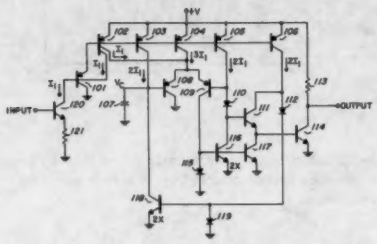
1. A circuit comprising an amplifier having a first transistor which has a first load transistor connected to a collector thereof, a second transistor which has a second load transistor connected to a collector thereof, means for transmitting a collector output of said first transistor to a base of said first transistor, means for transmitting a collector output of said first transistor to a base of said second transistor, an input terminal connected to a base of said first transistor, and a first output terminal connected to a collector of said second transistor, further comprising a capacitive element which is connected between said input terminal and said first output terminal, so that a collector output of said second transistor is fed back to a base of said first transistor so that said circuit operates as an oscillator, wherein means for making a collector current of said second transistor and a collector current of said second load transistor substantially equal, thereby to shorten the oscillator start-up time.

12. A circuit according to claim 9, wherein a current injected from the emitter to the base of said first load transistor is different from that of said second load transistor.

4,233,575
WIDE FREQUENCY RANGE CURRENT-CONTROLLED OSCILLATOR

Ronald H. Chapman, Wheaton, Ill., and Kenneth A. Hansen, Bedford, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 951,094, Oct. 13, 1978, abandoned.
This application Apr. 30, 1979, Ser. No. 34,303
Int. Cl.[2] H03K *3/26*
U.S. Cl. 331—111 **11 Claims**



1. A current-controlled oscillator for providing a digital output signal that is frequency controllable by an input control current, said current-controlled oscillator comprising:

timing-capacitor means for storing a timing-capacitor voltage;

current source means coupled to the timing capacitor means and the input control current for providing a first current having a predetermined magnitude dependent on the magnitude of the input control current;

differential voltage comparator means having first and second inputs, the second input coupled to the junction of the timing-capacitor means and the current source means for comparing the timing-capacitor voltage with the voltage at the differential-comparator first input and providing an output signal when the magnitude of the timing-capacitor voltage is greater than the magnitude of the voltage at the differential-comparator first input;

switchable current mirror means coupled to the junction of the timing-capacitor means and the current source means for sinking when enabled a second current having a magnitude that is related to the magnitude of the first current by a predetermined factor greater than one; and

switchable reference voltage means having first and second reference voltages, the first reference voltage greater than the second reference voltage, said switchable reference voltage means coupling the first reference voltage to the differential-comparator first input, disabling the switchable current mirror means to charge the timing capacitor means and providing a predetermined second state of the digital output signal when the differential-comparator output signal is not present, and coupling the second reference voltage to the differential-comparator first input, enabling the switchable current mirror means to discharge the timing capacitor means and providing a predetermined first state of the digital output signal when the differential-comparator output signal is present.

4,233,576
AUTOMATIC POLARIZATION DECOUPLING NETWORK

Guy M. Pelchat, Indialantic, Fla., assignor to Harris Corporation, Cleveland, Ohio

Filed May 16, 1978, Ser. No. 906,687
Int. Cl.[2] H01P *1/16*; H04B *1/10*
U.S. Cl. 333—16 **11 Claims**

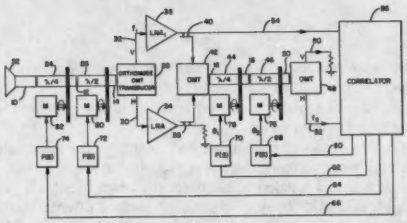
1. An automatic polarization decoupling network for reestablishing the orthogonality of at least a first and second originally orthogonally polarized transmitted signals which are cross-coupled comprising:

input means for receiving said first and second transmitted signals;

first means, coupled to said input means, for linearizing said first signal and rotating said linearized first signal to a predetermined reference direction;

first separator means, coupled to said first means, for separating the energy in said two signals which is polarized in said predetermined reference direction from the energy in said two signals polarized in a direction orthogonal to said predetermined reference direction, said energy polarized in said predetermined reference direction and said direction orthogonal to said predetermined reference direction being applied to first and second lines, respectively;

combining means, coupled to said first and second lines, for recombining at least part of the energy of said first and second lines;



second means, coupled to said combining means, for linearizing said second signal and rotating said linearized second signal to a direction orthogonal to said predetermined reference direction;

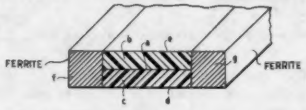
second separator means, coupled to said second means, for separating the energy in said two signals which is polarized in said predetermined reference direction from the energy in said two signals polarized in a direction orthogonal to said predetermined reference direction, said energy polarized in said predetermined reference direction being applied to a third line; and

correlator means, coupled to said second line and said third line, for appropriately correlating the signals on said second line and said third line and generating a plurality of control signals for controlling the linearization and rotation of said first and second signals in said first and second linearizing and rotating means.

4,233,577
FLAT TRANSMISSION PATH FOR COMMUNICATION SYSTEM

Dalmazio Raveglia; Carlo Lonati, both of Milan, and Giancarlo Macchi, Arzago D'Adda, all of Italy, assignors to Societa Italiana Telecomunicazioni Siemens S.p.A., Milan, Italy

Filed Jun. 11, 1979, Ser. No. 47,586
Claims priority, application Italy, Jun. 12, 1978, 24464 A/78
Int. Cl.[3] H01P *5/12, 3/00*; H01B *11/00*
U.S. Cl. 333—136 **5 Claims**



1. A transmission path for a communication system operating with pulsed signals, comprising:

a flat elongate inner conductor and two flat elongate outer conductors bracketing said inner conductor, said inner and outer conductors being substantially coextensive in width, the effective thickness of each of said conductors in

a common transverse plane being at most on the order of magnitude of the penetration depth of an alternating current at a frequency in the kHz range;

two dielectric layers of substantially the same width as said conductors and of greater thickness than the latter separating said inner conductor from said outer conductors, thereby forming with said conductors a stack of substantially rectangular cross-section; and

ferromagnetic elements alongside said stack for maintaining the lines of force of a magnetic field, generated by said pulse signals, substantially parallel to said conductors at the minor sides of said cross-section.

4,233,578

TRANSVERSAL FILTER

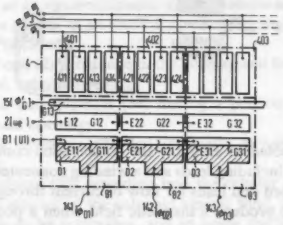
Karl Knauer, Kirchseeon, and Hans-Jörg Pfleiderer, Zorneding, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Mar. 12, 1979, Ser. No. 19,780

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1978, 2813971; Mar. 31, 1978, 2813972; Mar. 31, 1978, 2813997; Mar. 31, 1978, 2813998

Int. Cl.[2] **H03H** *7/28;* **H03K** *5/156;* **G11C** *19/28*

U.S. Cl. 333—165 **8 Claims**



1. A transversal filter comprising:

a doped semiconductor substrate;

an analog charge transfer device multistage shift register integrated on said substrate and including a transfer channel, a plurality of inputs and an output, each of said stages including a plurality of shift electrodes for receiving respective repetitive shift pulses; and

a plurality of evaluation circuits assigned to said shift register inputs and each including

a zone, separated on said substrate from like zones, and doped opposite to the doping of said substrate,

a respective electrical terminal for said oppositely doped zone for receiving first pulse voltages at a pulse repetition rate higher than the shift pulse repetition rate,

a first input gate and a second input gate, one of said input gates connected to receive an input signal and the other input gate connected to receive a constant DC voltage, and

a transfer gate directly adjacent said transfer channel and an electrical terminal connected thereto for receiving second voltage pulses.

4,233,579

TECHNIQUE FOR SUPPRESSING SPURIOUS RESONANCES IN STRIP TRANSMISSION LINE CIRCUITS

Eric R. Carlson, Fair Haven; Martin V. Schneider, Holmdel, and Ralph F. Trambarulo, Red Bank, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

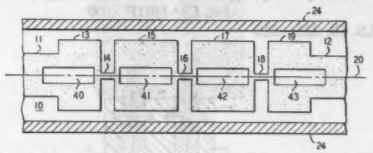
Filed Jun. 6, 1979, Ser. No. 45,992

Int. Cl.[3] **H01P** *1/203, 3/08*

U.S. Cl. 333—204 **7 Claims**

1. A strip transmission line circuit comprising a layer of an electrically conductive material which is deposited on a dielectric substrate (**10**), the layer being fabricated into a predetermined pattern of various width sections along a longitudinal axis (**20**) thereof to form various circuit elements which includes a wide section that forms a capacitive element (**13, 15, 17** or **19**)

CHARACTERIZED IN THAT



the wide section forming the capacitive element comprises an aperture (**40, 41, 42** or **43**) having dimensions which cause transverse resonances that may be excited in the strip transmission line circuit to be displaced outside a desired frequency band of interest.

4,233,580

ROTATING COUPLER FOR TRANSMITTING HIGH FREQUENCY ENERGY

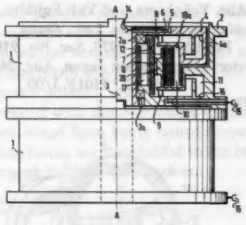
Leo Treczka, Munich, and Georg Spinner, Feldkirchen-Westerham, both of Fed. Rep. of Germany, assignors to Spinner GmbH, Munich, Fed. Rep. of Germany

Filed Nov. 22, 1977, Ser. No. 853,849

Claims priority, application Fed. Rep. of Germany, Nov. 23, 1976, 2653209; Nov. 23, 1976, 2653210

Int. Cl.[3] **H01P** *1/06, 7/06*

U.S. Cl. 333—261 **18 Claims**



1. A rotary coupler for coupling two relatively rotating circuits, said rotary coupler comprising:

first means defining a free inner space which permits connection leads to pass therethrough;

said rotary coupler having its rotational axis extending lengthwise through said iner space; and

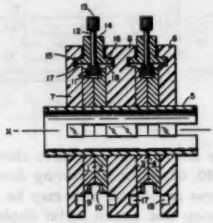
second means defining a resonant circuit disposed outside of said inner space and including folded resonant spaces, one of said folded resonant spaces being for energy transmission, and at least one of said folded resonant spaces being equal to between one-fourth and one-half, inclusive, of the principal wavelength to be transmitted via said rotary coupler.

4,233,581

MECHANISM FOR STATIC CONVERGENCE DEVICES FOR COLOR TELEVISION PICTURE TUBES

Claude Beaucamp, Montville, France, assignor to GTE Products Corporation, Stamford, Conn.

Filed Mar. 21, 1979, Ser. No. 22,533
Claims priority, application France, Mar. 24, 1978, 78 08743
Int. Cl.³ H01F 7/00
U.S. Cl. 335—212 **6 Claims**



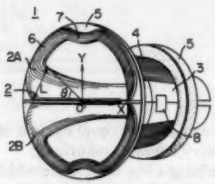
1. An improved color television picture tube static convergence device having a mounting sleeve for attachment to the neck of said tube, having at least one pair of magnetic rings rotatably mounted on said sleeve, each of said magnetic rings constructed and assembled with bevel gears located on their periphery facing each other, and having a rotatable rod radially directed with one end of said rod affixed to a knob and the other end of said rod affixed to a pinion engaged in said bevel gears of said magnetic rings, the improvement comprising non-rotatable non-magnetic rings mounted on said sleeve on either side of said pair of magnetic rings, each of said non-magnetic rings being provided with at least one circular groove located near the periphery of said ring on at least one side of said ring, a guide-member having bent ledges affixed thereto at least one point on each side thereof, said guide-member slidably mating with said grooves, said guide member being provided with a hole rotatably positioning said rod and pinion with respect to said bevel gears.

4,233,582

DEFLECTION YOKE FOR USE WITH WIDE ANGLE DEFLECTION SYSTEM

Masayuki Abe, Yokohama, and Yuji Fujihira, Fujisawa, both of Japan, assignors to Hitachi, Ltd., Japan

Filed May 30, 1978, Ser. No. 910,345
Claims priority, application Japan, Aug. 24, 1977, 52-101432
Int. Cl.³ H01F 5/00
U.S. Cl. 335—213 **14 Claims**



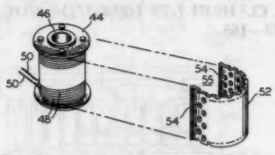
1. In a deflection yoke for use with a picture tube of a television receiver set comprising a cylindrical core, a vertical deflection coil toroidally wound around said core, and a pair of saddle-type horizontal deflection coils disposed to extend through said core, each of said horizontal coils having a winding width for producing a pincushion shaped deflection field at a front side of the yoke near a face plate of said picture tube due to passage of current through the horizontal coils so that a vertical pincushion distortion on the face plate is reduced and arched front and rear fringes on the front side near the face of said picture tube and on a rear side far from the face plate, respectively, the improvement wherein the front fringe on the front side of each of said horizontal deflection coils is so shaped that a center portion of said front fringe is so deformed that a distance between the center portion of said front fringe and a center axis of said deflection yoke is shorter than distance between any portion other than said center portion of the front fringe and said center axis, whereby a secondary harmonic distortion of the vertical pincushion distortion is reduced.

4,233,583

FLUX SHIELDED SOLENOID

William G. Novacek, South Egremont, Mass., assignor to Bicron Electronics Company, Canaan, Conn.

Filed Sep. 22, 1978, Ser. No. 944,793
Int. Cl.³ H01F 7/08
U.S. Cl. 335—236 **4 Claims**



1. In a solenoid assembly the combination comprising:

a. a coil including leads and a winding connected electrically between said leads for flow of current through said winding to produce a magnetic field when a potential difference is impressed across said leads, said winding having a longitudinally extending interior surface circumscribing an interior flux path and also having an exterior surface including two end surfaces and a longitudinal outer surface extending longitudinally between said end surfaces;

b. a ferromagnetic armature supported for longitudinal movement relative to one of said ends of said coil in response to magnetic flux produced by said coil, said armature including an elongated ferromagnetic bar extending longitudinally of said coil and biased to a first position in which it is partially inserted into the interior flux path of said coil, current greater than predetermined minimum causing enough force to be applied to said bar to move it from said first position to a second position in which it is further inserted into the interior flux path of said coil;

c. a bracket including a body portion and first and second arm portions extending transversely from opposite ends of said body portion, said body portion lying in a plane extending generally longitudinally of the axis of said coil, said arm portions extending over said end surfaces of said coil, said bar extending from said interior flux path of said coil beyond the plane of a first of said end surfaces of said coil when said armature is in said first position;

d. an actuating door pivotally mounted on said bracket, extending over said first end surface of said coil, and connected to the part of said bar extending beyond the plane of said first surface for pivotal movement of said door when said armature moves between said first position and said second position;

e. a ferromagnetic collar substantially surrounding said longitudinal surface of said coil to provide a high-permeability flux path exterior to and longitudinal of said coil; and

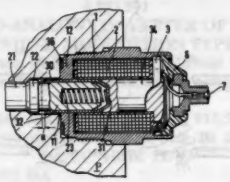
f. a thermosetting synthetic resin member extending about said longitudinal surface of said coil, said resin member encasing at least a portion of said collar and being bonded thereto.

4,233,584

FLUID-SEALED, ELECTROMAGNETIC VALVE OPERATING STRUCTURE, PARTICULARLY FOR COMBUSTION ENGINE FUEL INJECTION SYSTEM

Paul Füssner, Sindelfingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Feb. 14, 1979, Ser. No. 12,116
Claims priority, application Fed. Rep. of Germany, Mar. 24, 1978, 7809106[U]
Int. Cl.³ H01H 7/08
U.S. Cl. 335—260 7 Claims



1. Fluid-sealed, electromagnetic positioning device, particularly for use as an electromagnetic valve operator suitable in a fuel injection system of an internal combustion engine having

a housing (1);

a solenoid coil (2) positioned in the housing and formed with a central, tubular opening;

a magnetic core element (34) having a portion extending across said opening;

a magnetic armature (32) longitudinally movable in said opening;

a sealing sleeve (30) extending into the tubular opening to seal the interior of the solenoid against fluid, the flow of which is to be controlled, and to guide the longitudinal movement of the armature,

a closed bottom (31) formed on the sealing sleeve and positioned in close engagement with the inner face of the portion of the core (34) extending across said opening;

and an abutment (22) formed on the armature (32), said abutment being positioned beyond the end of the sleeve (30), the length of the sleeve and the position of the abutment being matched with respect to the length of travel of the armature (32) upon energization of the solenoid coil (2) to provide for a gap between the abutment (22) and the end of the sleeve (30) and maintenance of a gap between the end of the armature and the portion (34) of the core extending across the opening which is determined by the thickness of the closed bottom (31) of the sleeve to prevent sticking of the armature to the core and damage to the end of the sleeve (30) facing said abutment (22).

4,233,585

PLUNGER TYPE ELECTROMAGNET

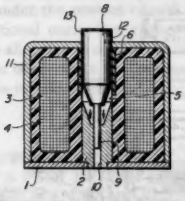
Shun-ichiro Sugimoto, and Hisazi Shinoki, both of Katsuta, Japan, assignors to Hitachi, Ltd., Japan

Filed Mar. 8, 1979, Ser. No. 18,735
Claims priority, application Japan, Mar. 10, 1978, 53-26560
Int. Cl.³ H01F 7/08
U.S. Cl. 335—262 2 Claims

1. A plunger type electromagnet comprising:

a plunger body slidingly moved by an electromagnetic force; and

a guide for guiding said plunger body in its sliding movement; wherein the improvement resides in applying a resin coat to a surface of said plunger body which surface is brought into sliding contact with said guide, and in using a resinous material for forming at least a portion of said



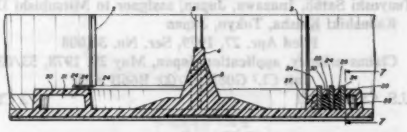
guide which portion is brought into sliding contact with said plunger body.

4,233,586

DISK PACK BOTTOM COVER WITH MAGNETIC LATCH

Roy Kaplow, Newton; David E. Butz, Littleton, and Alan L. Stenfors, Scituate, all of Mass., assignors to Data Packaging Corporation, Cambridge, Mass.

Filed Jan. 8, 1979, Ser. No. 1,596
Int. Cl.³ H01F 3/00, 7/02
U.S. Cl. 335—303 11 Claims



1. A magnetically latched bottom cover for a disk pack container, the cover being of the type constructed of a non-magnetic material and having a floor from which a central post extends upwardly, the improvement comprising:

(1) an annular retaining ring of non-magnetic material, the retaining ring surrounding the central post and being attached to the floor of the cover, the retaining ring providing a channel therein, and the retaining ring having parallel elongate slots extending therethrough to the channel,

(2) a plurality of parallel elongate plates disposed in the annular channel and extending through the parallel slots,

(3) a permanent magnet situated in the channel between two adjacent parallel plates whereby the plates act as magnetic poles of opposite polarity, and

(4) means associated with the pole plates whereby the pole pieces are prevented from being pulled through the slots and the pulling forces are transmitted to the retaining ring and therethrough to the bottom cover.

4,233,587

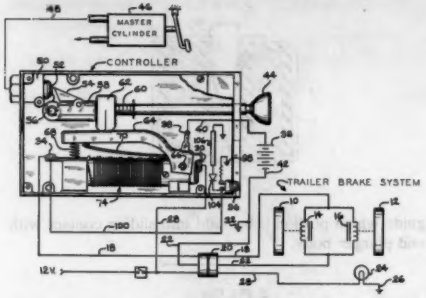
ELECTRIC BRAKING SYSTEM

Robert F. Augustine, Greendale, Wis., assignor to Kelsey Hayes Co., Romulus, Mich.

Filed Aug. 25, 1978, Ser. No. 937,009
Int. Cl.³ H01C 10/16
U.S. Cl. 338—96 18 Claims

1. A controller for an electric braking system and the like comprising: a longitudinally extending electrical resistor element having an electrically conductive surface, a longitudinally extending contact element supported for initial contact at one end of said electrically conductive surface and for progressive contact thereafter along the electrically conductive surface toward the other end, first electrical terminal means connected to said longitudinally extending contact and second electrical terminal means connected to said other end of said

electrical resistor element, said electrically conductive surface having alternate plateaus and valleys which cause said contact



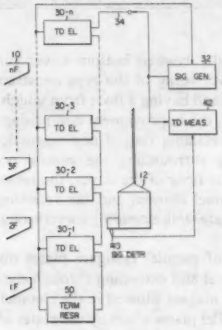
element to successively engage the plateau areas of said electrically conductive surface and bridge across said valleys.

4,233,588

ELEVATOR POSITION DETECTOR

Tsuyoshi Satoh, Inazawa, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 27, 1979, Ser. No. 34,008
Claims priority, application Japan, May 29, 1978, 53/63995
Int. Cl.[2] G08B *21/00*; B66B *3/02*
U.S. Cl. 340—21 **3 Claims**



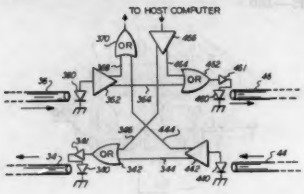
1. An elevator position detector device comprising, a hoistway, a plurality of landing floors disposed at equal intervals beside said hoistway, an elevator car for traveling in either of an upward and a downward direction within said hoistway and selectively stopping at said landing floors, a signal transmission line disposed along said hoistway, a signal generator for transmitting a signal to said signal transmission line, a plurality of signal delay elements disposed within said hoistway one for each landing floor and connected in a cascade manner to said signal generator through said signal transmission line to be successively applied with said signal, each of said signal delay elements being located at a position where a time delay corresponding to the associated landing floor is imparted to said signal passed therethrough, a signal detector disposed on said elevator car to detect said signal on said signal transmission line, and delay time measurement means connected to both said signal generator and said signal detector to measure a time delay of said signal detected by said signal detector with respect to signal delivered by said signal generator from which said detected signal results, thereby to determine a position of said elevator car.

4,233,589

ACTIVE T-COUPLER FOR FIBER OPTIC LOCAL NETWORKS WHICH PERMITS COLLISION DETECTION

Eric G. Rawson, Saratoga, and Robert M. Metcalfe, Palo Alto, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed May 25, 1979, Ser. No. 43,391
Int. Cl.[2] H04Q *9/00*; H04B *9/00*
U.S. Cl. 340—147 R **7 Claims**



1. An active T-coupler for fiber optic communication networks wherein the improvement is characterized by:

input detection means (**360, 440**) for each of a plurality of input fiber optic data busses (**36, 44**) each for generating electrical signals upon receipt of light signals on the related one of said input fiber optic data business,

means (**362, 442, 370**) coupled to said input detection means for transmitting said received signals to a utilization device and further output circuitry,

means (**466, 462, 342**) coupled to said utilization device for receiving signals generated by said utilization device, and

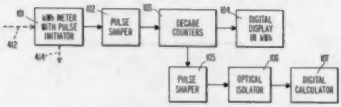
output generation means (**340, 341, 460, 461**) for each of a plurality of output fiber optic data busses (**34, 46**) coupled to said input detection means for any and all related input data bus or busses and said means for receiving signals generated by said utilization device, each for generating light signals in response to said signals generated by said utilization device or to be repeated as light signals in response to the electrical signals from said input detection means as related to said input fiber optic data busses.

4,233,590

SUPPLEMENTAL ENERGY REGISTER

Robert F. Gilkeson, 1084 Broadview Rd., Wayne, Pa. 19087, and John B. Blose, 2195 Winding Way, Broomall, Pa. 19008

Division of Ser. No. 798,943, May 20, 1977. This application Feb. 27, 1978, Ser. No. 881,580
Int. Cl.[2] G08G *19/16*; G01R *21/06*
U.S. Cl. 340—870.04 **8 Claims**



1. In a local energy consumer network, apparatus for evaluating cumulative energy consumption and the net cost thereof, comprising:

(a) metering means, in circuit with said network, for detecting consumption of successive specified increments of energy, said in circuit metering means providing successive pulses as indicative of current flow;

(b) pulse shaper means, responsive to said in circuit metering means, for generating an actuating pulse of predetermined duration, upon detection of each said successive pulse provided by said in circuit metering means;

(c) counter means incremented upon each occurrence of a said actuating pulse from said pulse shaper means;

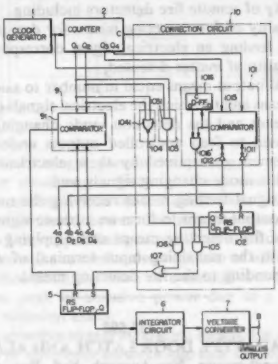
(d) means, responsive to said counter means, for producing control pulses in respective response to each said specified increment of said counter means;
(e) calculator display means, calibrated at a prevailing rate of cost per said specified increment, for presenting cumulative energy cost increments; and
(f) electrically isolating coupling means, responsive to said means for producing control pulses, for incrementing said calculator display means by one of said cost increments per each said control pulse.

4,233,591

DIGITAL-TO-ANALOG CONVERTER OF THE PULSE WIDTH MODULATION TYPE

Toshinori Murata; Shigeo Matsuura; Hiroshi Miyamoto, and Eisaku Akutsu, all of Yokohama, Japan, assignors to Hitachi, Ltd., Japan

Filed Jun. 19, 1978, Ser. No. 916,565
Claims priority, application Japan, Jun. 20, 1977, 52-72055
Int. Cl.³ H03K *13/02*
U.S. Cl. 340—347 DA **26 Claims**



1. A digital-to-analog converter of the pulse width modulation type comprising a clock pulse generator; a counter of plural-bit capacity coupled to the output of said clock pulse generator for counting the output clock pulses therefrom and for producing a carry-out signal when the count content of said counter becomes zero;

input terminals for the supply of input digital data bits to be converted into an analog signal provided in number corresponding to the bit capacity of said counter;

a flip-flop having a set input, a reset input and an output terminal; an integrator connected to the output terminal of said flip-flop for integrating the pulse widths of the output signal from said flip-flop;

wherein the bits of said counter are classified into two groups of a predetermined number of more significant bits and of the remaining number of less significant bits, while the digital input data bits are classified correspondingly into two groups of a predetermined number of more significant bits and of the remaining number of less significant bits;

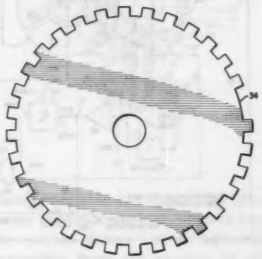
first means coupled between said less significant bit terminals of said counter, said digital data input terminals for said more significant bits and said reset input for controlling said flip-flop to divide the counting cycle period of said counter into 2^m elementary sub-periods, where m represents the number of said less significant bits at said digital data input terminals and to allocate a certain number of pulses to each of said elementary sub-periods in dependence on the data value of said more significant bits at said digital data input terminals; and second means connected to the more significant and less significant bit terminals and the carry-out output terminal of said counter, to said digital data input terminals for said less significant bits and to the set input of said flip-flop for controlling the setting of said flip-flop to provide the pulses in said elementary sub-periods under the control of said first means and to provide additional correction elementary pulses to said flip-flop to be allocated to selected ones of said elementary sub-periods in dependence on the data value of said less significant bits of said digital input data.

4,233,592

METHOD FOR DETECTION OF THE ANGULAR POSITION OF A PART DRIVEN IN ROTATION AND INSTRUMENTATION USING IT

Claude Leichle, Le Pecq, France, assignor to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed Dec. 4, 1978, Ser. No. 966,217
Claims priority, application France, Dec. 2, 1977, 77 36283
Int. Cl.² H03K *13/02*
U.S. Cl. 340—347 P **9 Claims**



1. A method of detecting the angular position of a part driven in rotation, integral with a disk provided on its periphery with a succession of mechanically identical teeth and notches and having one tooth removed to constitute an absolute reference, comprising the steps of:

locating a position sensor next to the periphery of the disk to detect the passage of the teeth and notches;

opertating a pulse generator at a frequency F;

resetting a counter-store to zero each time the position sensor detects the passage from a notch to a tooth;

accumulating in the counter-store the pulses of frequency F when a tooth is passing the position sensor;

emptying the counter-store at the frequency F/2 when a notch is passing the position sensor;

detecting the natural passage of the counter-store through the value zero, this instant corresponding to the falling edge of the absent tooth; and

modifying at said instant the state of a flip-flop.

4,233,593

CAPACITIVE TOUCH CONTROL AND DISPLAY

John E. Bigelow, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 879,368, Feb. 21, 1978, Pat. No. 4,158,216. This application Jun. 12, 1978, Ser. No. 914,373
Int. Cl.² G06F *3/02*; H01H *19/00*
U.S. Cl. 340—365 C **13 Claims**

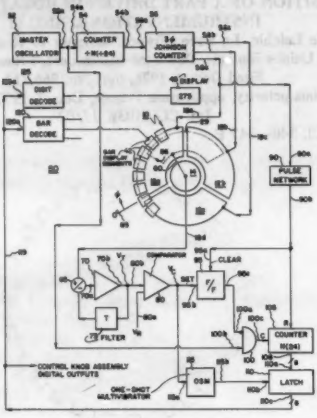
11. A capacitive control assembly for use on a solid panel having front and rear surfaces, comprising:

a plurality (M) of input electrodes disposed about a common center and fabricated upon said panel rear surface; the centers of adjacent input electrodes separated from one another by an angle about said common center substantially equal to (360/M) degrees, where M is an integer greater than one;

a movable electrode positioned adjacent to said panel front

surface and rotationally alignable to overlap one portion of at least one of said input electrodes to vary the electrical capacitance between said movable electrode and those of said plurality of input electrodes overlapped by said movable electrode;

means connected to each of said plurality of input electrodes and to said movable electrode for recognizing a change in differential capacitance between the movable electrode and each of the plurality of input electrodes to determine the rotational position of said movable electrode with respect to a reference point;



means magnetically attachable to and detachable from said panel front surface for supporting said movable electrode at a fixed distance parallel to said panel front surface during rotation of said movable electrode; and

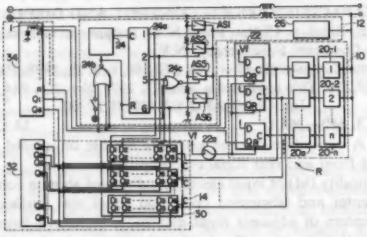
a disk electrode positioned upon said panel rear surface and within the annulus formed by said plurality of input electrodes, said disk electrode being capacitively coupled to said movable electrode through said supporting means and directly coupled to said capacitance recognizing means.

4,233,594

FIRE DETECTION AND OBSERVATION SYSTEM

Takeshi Tanigawa, Machida, and Yukio Yamauchi, Kawasaki, both of Japan, assignors to Hochiki Corporation, Tokyo, Japan

Filed May 14, 1979, Ser. No. 38,954
Claims priority, application Japan, May 18, 1978, 53/59092
Int. Cl.[2] G08B *25/00*
U.S. Cl. 340—525 **5 Claims**



1. A fire observation system capable of detecting the break of a fire at a place and searching the development of fire at the place and at an area surrounding the place, said system comprising

a central receiving device including

a means having three output stages and forming detection mode changing signals so as to substantially feed three kinds of output, said three output stages comprising a first output stage for feeding first detection mode changing signals to detect an extent of relatively small quantity of matter, a middle output stage for feeding middle detection mode changing signals to detect an extent of reference quantity of matter, and a second output stage for feeding second detection mode changing signals to detect an extent of relatively large quantity of matter,

a plurality of AND means having at least two input terminals and an output terminal, and feeding the values of impressed detection mode changing signals by impressing the output of detection mode change signal forming means to one of input terminals and applying a signal to the remaining input terminal, and

a display means having the output values of AND means applied thereto and displayed therein; and

a plurality of remote fire detectors including

a plurality of fire detecting means for detecting a matter and feeding an electrical signal corresponding to the quantity of matter detected,

fire signal output means equal in number to said fire detecting means and to which the electrical signals of fire detecting means and the detection mode changing signals are impressed to feed controlled outputs under the output requirement determined by these electrical signals and detection mode changing signals, and

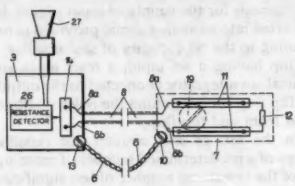
intrinsic signal feeding means receiving the outputs of fire signal output means to form an intrinsic signal allotted to each of fire detecting means and supplying the intrinsic signal to the remaining input terminal of AND means corresponding to the fire detecting means.

4,233,595

CHAIN-TYPE DOOR LATCH AND ALARM

Franz J. Landkammer, Neu-Anspach, Fed. Rep. of Germany, assignor to Christoph Emmerich KG, Frankfurt am Main, Fed. Rep. of Germany

Filed Nov. 30, 1978, Ser. No. 964,923
Int. Cl.[3] G08B *13/06*
U.S. Cl. 340—542 **13 Claims**



1. A door latch and alarm apparatus comprising:

a door-mounted support;

a doorjamb-mounted support;

a relatively inextensible and flexible element anchored to said door support and having a free end provided with an end piece receivable in said doorjamb support;

latch means including key-operable mechanism on said doorjamb support for releasably securing said end piece thereto, whereby the door can open a limited distance from the doorjamb before said element becomes taut and impedes further opening;

circuit means including a pair of conductors extending between said door support and said end piece and a relatively fragile connector in said end piece forming a closed conductive path with said conductors, said connector

being so much weaker than said element that when same is stressed beyond a certain limit said connector interrupts said path before said element breaks; and

alarm means on said door-support connectable to said conductors for emitting an alarm when said path is interrupted.

4,233,596

FLARE MONITORING APPARATUS

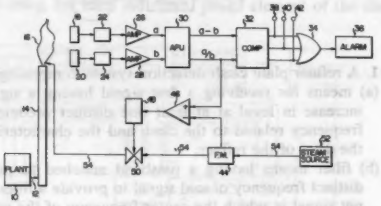
Hiroo Okamoto, Tokyo, and Shunsaku Nakauchi, Mitaka, both of Japan, assignors to Showa Yuka Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 15, 1978, Ser. No. 933,869

Claims priority, application Japan, Aug. 24, 1977, 52-101363

Int. Cl.[2] F23N *5/08*; G01J *1/18*

U.S. Cl. 340—578 3 Claims



1. A flare monitoring apparatus comprising:

a means for measuring a first emissive power of infrared radiation emitted from a flare at a first wave length which a peak of emissive power due to a resonance infrared radiation from a specified gas contained in a flue gas in the flare exists and a second emissive power of infrared radiation emitted from the flare at a second wave length at which no peak of emissive power due to a resonance infrared radiation exists;

a means, responsive to said measuring means, for calculating the ratio or difference between said first and second emissive powers and for producing signals corresponding respectively to said ratio and difference and representing a burning state of the flare including the generation of black smoke in the flare, excessiveness of the flare and the extinguishment of the flare;

a means for detecting the burning state of the flare including a comparator which receives said signals from said calculating means for producing an output signal when said signals exceed or fall below predetermined reference levels; and

an alarm for receiving said output signal from said detecting means and producing an alarm;

wherein the generation of black smoke in the flare is detected based on said ratio, and the excessiveness of the flare and the extinguishment of the flare are detected based on said difference.

4,233,597

DEVICE INDICATING A STATE DUE TO THE PRESSURE MODIFICATION

Gerhard Kurz, Industriestrasse, 7261 Althengstett, Fed. Rep. of Germany

Filed Mar. 20, 1978, Ser. No. 888,426

Claims priority, application Fed. Rep. of Germany, Mar. 19, 1977, 2712201

Int. Cl.[2] G08B *21/00*

U.S. Cl. 340—626 6 Claims

1. An apparatus for indicating pressure variations caused by the accumulation of dust in a vacuum cleaner, said apparatus comprising:

a housing having two hollow ends and an intermediate chamber portion having an outer periphery smaller than the outer periphery of at least one of said hollow ends therebetween;

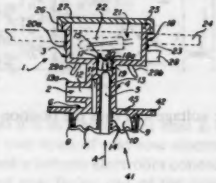
a diaphragm directly secured over a first hollow end of said housing to form a first chamber;

a lamp disposed in a second hollow end of said housing;

switching means disposed within said intermediate chamber, said switching means comprising a contact element secured to said housing adjacent said second hollow end and a contact pin slidably mounted in the housing and having one end connected to the diaphragm and its other end adjacent the contact element;

means for resiliently urging said contact pin away from said contact element;

means for adjustably varying the position of the contact element with respect to the contact pin, said adjustable varying means being accessible from the second hollow end of the housing;



said housing being insertable into a receiving opening of the vacuum cleaner such that the lamp remains exposed exteriorly of the vacuum cleaner and the adjustable varying means is accessible from the exterior of the vacuum cleaner;

said chamber portion having an outwardly extending conduit including a port being connected to a pressure source in the vacuum cleaner which in conjunction with the pressure exteriorly of the diaphragm, is indicative of the pressure variations of the vacuum cleaner, and further having a fluid passageway adjacent said intermediate chamber connecting said conduit to said first chamber, and

electrical circuit means for illuminating said lamp upon contact of said contact pin with the contact element.

4,233,598

EMERGENCY STOP CIRCUIT MONITORING SYSTEM

Robert J. Green, and Gerald A. Hales, both of Deptford, England, assignors to Molins Limited, England

Filed Aug. 18, 1978, Ser. No. 934,884

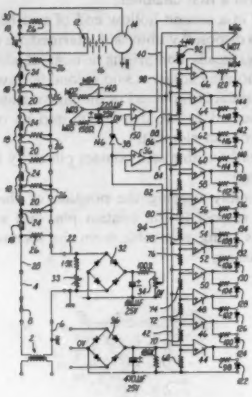
Claims priority, application United Kingdom, Aug. 30, 1977, 36119/77

Int. Cl.[3] G08B *25/00*

U.S. Cl. 340—652 8 Claims

1. A monitoring system for use with a power supply line including a series of sections in which open circuit conditions may occur, said monitoring system comprising: a plurality of monitoring impedances each having one side connected to a different section of the supply line; a common monitoring line connected in parallel to said sections of said supply line; the other side of each monitoring impedance being connected to the monitoring line; summing means connected to the monitoring line for summing the currents in the monitoring impedances and for producing an analogue voltage proportional to the sum of the said currents; comparator means adapted to compare the said analogue voltage with a plurality of preset

reference voltages; and indicator means connected to the said comparator means so as to provide an indication of the level of



the analogue voltage and thus the position of the supply interruption.

4,233,599

MALFUNCTION DETECTOR FOR SPEED SENSORS

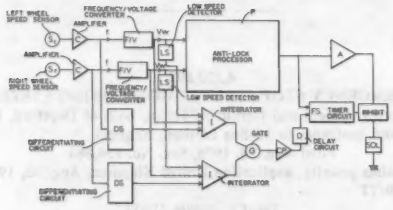
Malcolm Brearley, Solihull, England, assignor to Girling Limited, Birmingham, England

Filed Feb. 28, 1979, Ser. No. 16,351

Claims priority, application United Kingdom, Feb. 28, 1978, 07794/78

Int. Cl.³ G08B *21/00*; B60Q *1/00*

U.S. Cl. 340—679 **14 Claims**



8. Means for monitoring operation of a speed sensor that generates a pulse signal with a repetition frequency related to the speed being sensed, the means comprising a convertor for deriving an analogue speed signal from said pulse signal, integrating means for integrating said analogue speed signal in the periods between successive pulses of said pulse signal so as to obtain a separate integrated sum for each period, and comparison means for comparing the integrated sum obtained from said integrating means for each period with a reference value corresponding to a limit for normal generation of pulses so that a warning signal is produced if said integrated sum exceeds said reference.

4,233,600

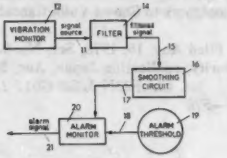
METHOD AND SYSTEM FOR DETECTING PLATE CLASHING IN DISC REFINERS

James H. Rogers, Beaconsfield, and Donald J. Butler, Grand Falls, both of Canada, assignors to Pulp and Paper Research Institute of Canada, Pointe Claire, Canada

Filed Jun. 7, 1978, Ser. No. 913,409

Int. Cl.³ G08B *21/00*

U.S. Cl. 340—683 **10 Claims**



1. A refiner plate clash detection system comprising:

(a) means for receiving a first signal having a significant increase in level at at least one distinct predetermined frequency related to the clash and the characteristics of the discs of the refiner,

(b) filter means having a passband matched to pass said distinct frequency of said signal to provide a filtered output signal in which the center frequency of the passband of the filter is determined by the formula

$$f_o = n \Sigma_R$$

wherein

f_o is the center frequency (expressed in Hertz) of said passband

n = the number of segments at a given radius, per single disc and

Σ_R = the sum of the rotational rates (expressed in Hertz) of the two discs enclosing a given refining volume,

(c) means for smoothing said filtered signal,

(d) means for establishing a threshold level,

(e) comparator means for receiving said smoothed signal and for comparing it with said threshold level and for providing an output signal of predetermined form, upon said smoothed signal's exceeding said threshold level, and

(f) means for receiving said output signal for generating an alarm operation signal in response thereto.

4,233,601

DISPLAY SYSTEM

Harold C. A. Hankins, Glossop; Gordon Hughes, Macclesfield, and Robert W. Laker, Polegate, all of England, assignors to International Computers Limited, London, England

Filed Mar. 31, 1978, Ser. No. 892,206

Claims priority, application United Kingdom, Apr. 4, 1977, 14122/77

Int. Cl.² G06F *3/14*

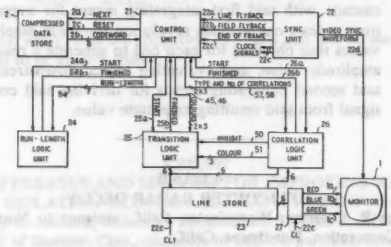
U.S. Cl. 340—703 **6 Claims**

1. Decoding apparatus for providing a drive output for a display device arranged to produce a display formed of a plurality of image elements scanned in a predetermined sequence, in a plurality of display lines, each element having a selected one of at least three possible image display values dependent on the drive output, the apparatus comprising:

means for receiving each of a sequence of code elements, in turn, forming a coded representation of a display line, the sequence of code elements defining the display values of the image elements in the sequence in which they are scanned and comprising at least one first code element associated with an image group, said image group consisting of N sequentially occurring image elements, N being an integer greater than one but less than the number of

image elements in a display line, said first code element indicating the display value of each of the N image elements of said image group and at least one second code element indicating only the number of image groups in a segment of M image groups, where M is an integer, and the display value of all image elements in the segment being the same and equal to the display value of the image element immediately preceding said segment, whereby a run of any number of image elements of the same display value, whether or not the transitions bounding the run are aligned with the boundaries between code elements, may be defined by a first code element defining at least the first two image elements of the run followed by at least one second code element and, if required, another first code element defining at least the final image element of the run;

means for decoding each code element, before the receipt of the following code element, to produce a control output indicating, for each individual image element of the display line, the display value of that element, which means comprises first decoding means responsive to the receipt of each first code element for causing the control output to indicate the display value of each of the individual image elements of the image group represented by that first code element, means for storing, at the completion of the decoding of each code element to produce the said control output, an indication of the display value of the final image element of those so far decoded into the control output, and second decoding means responsive to the receipt of each second code element and to the indication of a display value stored in the said storing means at that time for causing the control output to indicate the same display value of each individual image element in the segment of M image groups indicated by that second code element, which display value is that stored in the said storing means;



and means for converting the said control output into a drive output for the display.

4,233,602

MULTI-MATRIX DISPLAY SYSTEM HAVING MATRIX DISPLAY PANEL WITH UNCROSSED CONNECTIONS ON SUBSTRATES

Hisao Hanmura, Hitachi, Japan, assignor to Hitachi, Ltd., Japan

Filed Mar. 28, 1978, Ser. No. 891,036

Claims priority, application Japan, Mar. 30, 1977, 52/34438; Feb. 8, 1978, 53/12453

Int. Cl.³ G06F *3/14*

U.S. Cl. 340—752 **5 Claims**

1. In a multi-matrix display system having a matrix display panel, said matrix display panel comprising:

picture elements arranged in the form of a matrix having a plurality of rows and columns;

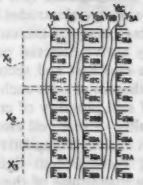
a plurality of row electrodes each commonly connected to at least two columns of said picture elements;

a plurality of column electrodes arranged transversely to each of said row electrodes; and

a display material electrically excitable and arranged between said row electrodes and said column electrodes for constituting said picture elements to be displayed when said row and column electrodes are selectively energized;

means for controlling the brightness of each of said picture elements by selectively applying a signal related to a level of desired brightness between a corresponding row electrode and one or more corresponding column electrodes, including means for sequentially scanning said row electrodes and means for varying said brightness signal in accordance with an applied video signal;

n rows of said picture elements being arranged to face each row of said row electrodes, and each column of said plurality of picture elements being provided with n column



electrodes, where n is an integer of at least 2, and in front of any adjacent two rows of said row electrodes, a first one of each of said n column electrodes connects a picture element of a first row facing one of the row electrodes with a picture element of an nth row facing the other of the row electrodes, a second one of each of said n column electrodes connects a picture element of a second row facing the one of the row electrodes with a picture element of an (n−1) the row facing the other of the row electrodes, and an nth one of each of said n column electrodes connects a picture element of an nth row facing the one of the row electrodes with a picture element of a first row facing the other of the row electrodes.

4,233,603

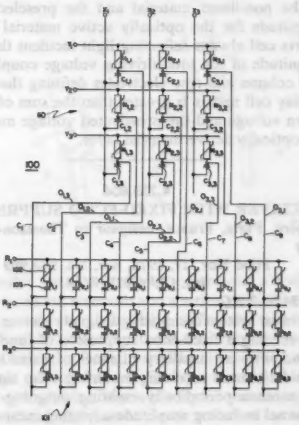
MULTIPLEXED VARISTOR-CONTROLLED LIQUID CRYSTAL DISPLAY

Donald E. Castleberry, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Nov. 16, 1978, Ser. No. 961,223

Int. Cl.² G06F *3/14*

U.S. Cl. 340—783 **44 Claims**



1. A multiplexible matrix reflective display, comprising:

a plurality of substantially parallel and substantially transparent elongated and continuous column electrodes arranged spaced each from the others in a first direction in a first plane, each of said column electrodes adapted for having a column driving voltage coupled thereto;

a plurality of reflective and substantially flat coplanar rear cell electrodes arranged spaced each from the others in a matrix extending in both said first direction and in a second direction, substantially transverse to said first direction, in a second plane parallel to, and spaced behind, said first plane;

a plurality of substantially parallel row electrodes arranged spaced each from the others in said second direction and with only one of the row electrodes positioned substantially parallel to an associated row of said rear cell electrodes, each of said row electrodes adapted for having a row driving voltage coupled thereto;

a layer of optically active material positioned as the only element between said first and second planes, said layer having a matrix therein of cells each defined by the registration of one of said plurality of column electrodes and one of said plurality of rear cell electrodes; the optically active material in each cell respectively absorbing therein and transmitting therethrough light entering said cell responsive to the magnitude of the voltage between the portions of the column and rear cell electrode defining said cell being respectively less than and at least equal to a preselected voltage magnitude;

a member of an electrically non-linear resistive material, positioned substantially parallel to the plane of at least said optically active layer and substantially covering the entire area of and in registration with said optically active layer, said member having a matrix of positions defined thereon with each position forming a passive, monotonic non-linear resistance element in correspondence to one display cell of the display cell matrix, said material having a preselected break-down voltage below which break-down voltage substantially no current flows through said material and above which break-down voltage substantial amounts of current can flow therethrough and with a voltage drop across said member being substantially equal to said break-down voltage; and

means for coupling each matrix position of said member between an associated rear cell electrode defining a matrix cell and the row electrode associated with that rear cell electrode;

each matrix cell absorbing light incident thereon if the magnitude of a total driving voltage coupled between the column and row electrodes defining that cell in the display cell matrix is less than the sum of the break-down voltage of the non-linear material and the preselected voltage magnitude for the optically active material layer; each matrix cell always reflecting light incident thereon if the magnitude of the total driving voltage coupled between said column and row electrodes defining that cel of said display cell matrix is greater than the sum of said break-down voltage and the preselected voltage magnitude for the optically active material layer.

4,233,604

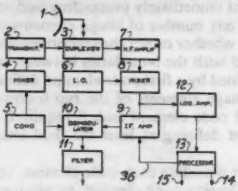
RECEIVER WITH FIXED-ECHO SUPPRESSOR

Guy Lepère, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Nov. 27, 1978, Ser. No. 963,989
Int. Cl.³ G01S 7/34
U.S. Cl. 343—7 AG **8 Claims**

1. In a radar system comprising a signal receiver with a main channel, feeding a fixed-echo suppressor of limited dynamic range, and with an ancillary channel of extended dynamic range, said channels receiving incoming echo signals from a rotating antenna periodically emitting outgoing pulses, said main channel including amplitude-adjusting means responsive to a control signal from said ancillar channel,

the improvement wherein said ancillary channel comprises logical circuitry responsive to synchronization and antenna-position signals for dividing the area swept by the radar into a predetermined number of range-and-azimuth cells each encompassing a plurality of pulse-repetition cycles, first integrating means controlled by said logical circuitry for averaging the amplitudes of said incoming echo signals



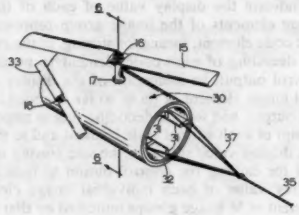
over each one of said cells, second integrating means in cascade with said first integrating means for averaging over at least one antenna revolution the mean amplitude values thus obtained for each cell to generate a resulting amplitude value, and evaluating means downstream of said second integrating means for deriving said control signal from said resulting amplitude value.

4,233,605

HELICOPTER RADAR DECOY

John R. Coleman, Westminster, Calif., assignor to Northrop Corporation, Hawthorne, Calif.

Filed Feb. 15, 1979, Ser. No. 12,574
Int. Cl.³ H01Q 15/18
U.S. Cl. 343—18 D **6 Claims**



1. A Doppler radar decoy comprising:

(a) a body portion including a disk and keel member depending therefrom;

(b) rotor shaft means mounted on said body portions; and

(c) rotor means including an internal retro-directive spar mounted to rotate on said shaft means.

4,233,606

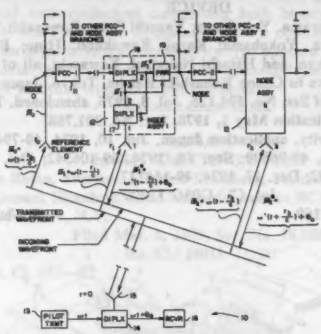
FREQUENCY TRANSLATING PHASE CONJUGATION CIRCUIT FOR ACTIVE RETRODIRECTIVE ANTENNA ARRAY

Alan M. Lovelace, Administrator of the National Aeronautics and Space Administration, with respect to an invention of, and Ralph C. Chernoff, Los Angeles, Calif.

Filed Dec. 29, 1978, Ser. No. 974,471
Int. Cl.³ H04B 7/00
U.S. Cl. 343—100 TD **14 Claims**

1. In an active retrodirective array of antenna elements, a separate frequency shifting phase conjugation means associated with and coupled to each element by a transmission line for receiving a signal of phase ϕ_1 from the associated element over said transmission line and transmitting to the associated

element a signal of conjugate phase ϕ_1^* equal to $R(2\phi_o - \phi_1)$ where ϕ_o is a signal of reference phase from a chosen element



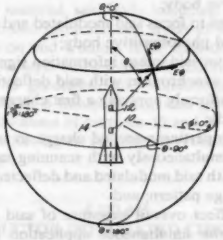
of said array, R is the reciprocal of 1–2/n and n is an integer equal to or greater than 4.

4,233,607

APPARATUS AND METHOD FOR IMPROVING R.F. ISOLATION BETWEEN ADJACENT ANTENNAS

Gary G. Sanford; Robert E. Munson, and Thomas A. Metzler, all of Boulder, Colo., assignors to Ball Corporation, Muncie, Ind.

Filed Oct. 28, 1977, Ser. No. 846,347
Int. Cl.[2] H01Q *1/38*
U.S. Cl. 343—700 MS **20 Claims**



1. A system of antenna arrays having improved r.f. isolation therebetween, said system comprising:

a first antenna array and connected first r.f. feedline disposed at a first location for transmitting r.f. energy from an r.f. source according to a predetermined three-dimensional first radiation pattern;

a second antenna array and connected second r.f. feedline disposed at a second location for receiving r.f. energy according to a predetermined three-dimensional second radiation pattern such that some r.f. energy from said first antenna array is undesirably received by said second antenna array; and

first and second additional r.f. radiating element means, each being connected to the respectively corresponding said first and second feedlines and disposed at the respectively corresponding one of said first and second locations,

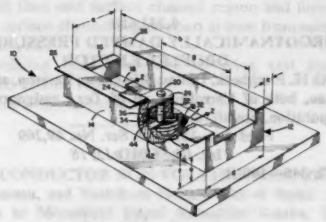
said first and second additional r.f. radiating element means being connected to transmit or receive r.f. energy of a predetermined magnitude and phase so as to substantially cancel said r.f. energy undesirably received by said second antenna array.

4,233,608

BROADBAND ANTENNA ELEMENT

Robert L. Moran, Rand, Colo., and Francis J. O'Hara, Bedford, Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Sep. 29, 1976, Ser. No. 727,731
Int. Cl.[3] H01Q *21/00*
U.S. Cl. 343—728 **2 Claims**



1. An antenna element, suitable for operation over greater than an octave band of frequencies, comprising:

(a) a waveguide section having a rectangular cross-section defined by opposing pairs of narrow and broad walls dimensioned to support the TE_{10} mode above a cutoff frequency within the band of operating frequencies, a first end of said waveguide section being terminated in a short circuit and a second end of said waveguide section being terminated in an open circuit for radiating radio frequency energy; and

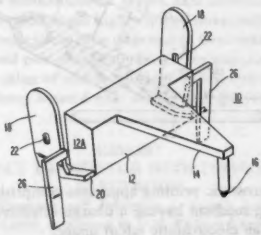
(b) a loop radiator disposed within said waveguide section adjacent the second end thereof, said loop radiator exciting the TE_{10} mode within said waveguide section at frequencies greater than the cutoff frequency of said waveguide section and said loop radiator further being the principal source of radiation at frequencies below the cutoff frequency of the waveguide section.

4,233,609

DISPOSABLE INSTRUMENT PEN WITH INTEGRAL SPRING MEMBER

James R. Hubbard, Moorestown, N.J., assignor to Graphic Controls Corporation, Cherry Hill, N.J.

Filed Jun. 7, 1978, Ser. No. 913,320
Int. Cl.[3] G01D *15/16*
U.S. Cl. 346—140 A **7 Claims**



1. Disposable instrument marker pen having a body member which houses an ink reservoir and a writing nib extending from said housing, said pen including a deflectable elastic member integrally formed with said pen and constructed from the same material as said pen body, said elastic member adapted to maintain said pen in relatively fixed position relative to a mating means with which said pen is adapted to mate by reason of deflection of said deflectable elastic member by said mating means, said mating means comprising a pen carriage assembly, and wherein said elastic member comprises a pair of wing

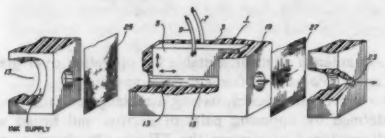
members, said carriage assembly comprising a generally "U" shaped member having a pair of upstanding mounting members defining the two upstanding legs of said "U" shape and wherein said wing members are resiliently fitted between said upstanding mounting members to maintain said pen in a relatively fixed position relative to said carriage assembly.

4,233,610

HYDRODYNAMICALLY DAMPED PRESSURE PULSE DROPLET EJECTOR

Kenneth H. Fischbeck, Dallas; Stig-Göran Larsson, and S. Bertil Sultan, both of Carrollton, all of Tex., assignors to Xerox Corporation, Stamford, Conn.

Filed Jun. 18, 1979, Ser. No. 49,269
Int. Cl.³ G01D *15/18*
U.S. Cl. 346—140 R **2 Claims**



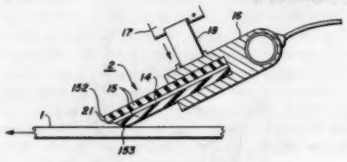
1. A pulsed pressure drop ejecting apparatus wherein a transducer **(1)** is utilized to compress liquid **(13)** in a channel **(15)** to express a droplet from an orifice **(23)** upon application of a signal to the transducer **(1)**, the improvement comprising the addition of at least one energy dissipative element **(25, 27)** in the channel **(15)** so as to achieve simultaneous acoustic impedance matching and near critical hydraulic damping.

4,233,611

RECORDING HEAD FOR ELECTROSTATIC PRINTING APPARATUS

Keita Nakano, Yokohama, and Yasuo Shibata, Atsugi, both of Japan, assignors to Rank Xerox Limited, London, England

Filed Dec. 7, 1978, Ser. No. 967,199
Claims priority, application Japan, Oct. 14, 1977, 52-122322
Int. Cl.³ G01D *15/06*
U.S. Cl. 346—155 **15 Claims**



1. An electrostatic printing apparatus comprising

a recording medium having a charge retentive surface for forming an electrostatic latent image,

means for developing the electrostatic latent image formed on the recording medium,

a support material,

means for transferring the developed electrostatic latent image to the support material,

an array of marking electrodes disposed adjacent the recording medium for selectively charging the charge retentive surface, and

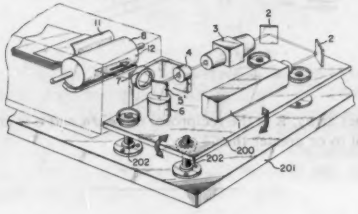
a flexible insulator supporting the marking electrodes, the insulator adjoining the recording medium whereby to uniformly space the array of electrodes from the recording medium.

4,233,612

IMAGE INFORMATION ELECTROSTATIC RECORDING DEVICE

Kazuhiro Hirayama, Yokohama; Yasushi Sato, Kawasaki; Taisuke Tokiwa, Yokohama; Kazuo Kawakubo, Hino; Fujio Iwatate, Tokyo, and Hisashi Nakatsui, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 594,126, Jul. 8, 1975, abandoned. This application May 1, 1978, Ser. No. 901,788
Claims priority, application Japan, Jul. 10, 1974, 49-79475; Aug. 22, 1974, 49-96500; Sep. 14, 1974, 49-106342; Oct. 14, 1974, 49-117892; Dec. 17, 1974, 49-144727
Int. Cl.³ G03G *15/00*
U.S. Cl. 346—160 **48 Claims**



1. An image information recording device which comprises in combination:

a. an He-Ne gas laser oscillator for generating a laser beam modulated by an image information signal;

b. a photosensitive body consisting essentially of an insulating layer, a photoconductive layer and an electrically conductive substrate, said photoconductive layer comprising cadmium sulfide (CdS);

c. deflection means to cause said laser beam to scan on said photosensitive body;

d. optical means to focus said modulated and deflected laser beam on said photosensitive body;

e. means to input said image information signal to said laser oscillator in synchronism with said deflection means;

f. means for uniformly applying a first charge to said photosensitive body;

g. means for imparting a second charge to said photosensitive body simultaneously with scanning said photosensitive body with said modulated and deflected laser beam to form an image pattern; and

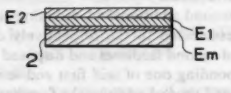
h. means to effect overall exposure of said photosensitive body after the simultaneous application of the second charge and said modulated and deflected laser beam on said photosensitive body to form a high contrast electrostatic latent image.

4,233,613

COMPOUND SEMICONDUCTOR WAFER

Kiyoshi Morimoto, Mobara, Japan, assignor to Futaba Denshi Kogyo K.K., Chiba, Japan

Filed Aug. 31, 1978, Ser. No. 938,977
Claims priority, application Japan, Sep. 6, 1977, 52-106232
Int. Cl.² H01L *33/00*
U.S. Cl. 357—16 **12 Claims**



1. A compound semiconductor wafer comprising a substrate of a IV-group element semiconductor having a predetermined conductivity type, an epitaxial layer formed by epitaxially growing on said substrate a compound semiconductor having

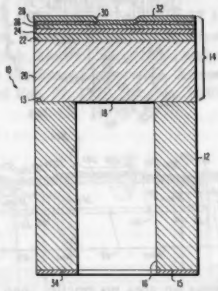
the same conductivity type as the substrate by an ion beam deposition process or a cluster ion beam process, said compound semiconductor being selected from a group of compound semiconductors comprising both binary and ternary III-V semiconductor compounds; and a compound semiconductor layer having a conductivity type opposite to that of said epitaxial layer and formed on said epitaxial layer so as to form a PN junction with said epitaxial layer.

4,233,614

LIGHT EMITTING DIODE

Dan Botez, Trenton; Michael Ettenberg, Freehold, and Henry Kressel, Elizabeth, all of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Mar. 6, 1979, Ser. No. 18,055
Int. Cl.³ H01L *33/00*
U.S. Cl. 357—17 **6 Claims**



1. A light emitting semiconductor device comprising

a body of semiconductor material on a substrate of a semiconductor material, said body including a window layer adjacent to said substrate, and layers of opposite conductivity type on said window layer with the layer adjacent said window layer being a recombination region in which light can be generated, said window layer being of a material which is transparent to said generated light and having a thickness of between 15 and 30 microns, and

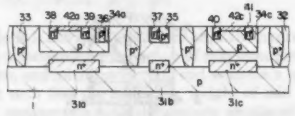
said substrate having an opening therethrough to said window layer.

4,233,615

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE

Toyoki Takemoto, Yahata; Tadao Komeda, Yamatotakada; Haruyasu Yamada, and Michihiro Inoue, both of Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Aug. 10, 1978, Ser. No. 933,045
Claims priority, application Japan, Aug. 25, 1977, 52-102427
Int. Cl.² H01L *29/80, 29/78*
U.S. Cl. 357—22 **25 Claims**



1. A semiconductor integrated circuit device having on a monolithic substrate:

a junction-type field effect transistor comprising:

a gate region of a first conductivity type,

a source region and drain region which are both formed apart from each other in said gate region and of a second conductivity type that is opposite to said first conductivity type,

a surface channel region of said second conductivity type and lower resistivity, and formed shallower than said source region and said drain region in a manner to connect said source region and said drain region,

an impurity doped surface region of said first conductivity type, higher impurity concentration and a shallower depth than said surface channel region and formed in said surface channel region apart at least from said drain region, and

an insulating film completely covering said impurity doped surface region; and

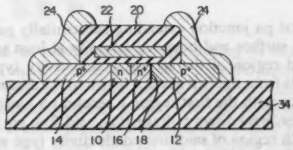
at least one other semiconductor device.

4,233,616

SEMICONDUCTOR NON-VOLATILE MEMORY

Mikio Kyomasu, and Yoshiharu Nakao, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 30, 1978, Ser. No. 910,950
Claims priority, application Japan, Jun. 8, 1977, 52-68217
Int. Cl.² H01L *29/78*
U.S. Cl. 357—23 **6 Claims**



1. A semiconductor non-volatile memory unit composed of at least one memory cell comprising a semiconductor layer of a first type conductivity, said memory cell having a separately provided pair of semiconductor regions of the opposite type conductively disposed in a spaced relationship with at least a portion of said semiconductor layer therebetween to form a gate region therebetween, an electrically insulating film disposed on said gate region for performing a storing operation by having an electric charge accumulated therein, and means for providing a pn junction with only one of said pair of semiconductor layers and for providing no pn junction with the other of said pair of semiconductor layers, said means comprising a separately provided single highly doped semiconductor region of the first conductivity type disposed to form said pn junction with one of said pair of semiconductor regions and to be separate from the other of said pairs of semiconductor regions, said pn junction being located only within said gate region.

4,233,617

FIELD EFFECT TRANSISTOR WITH INSULATED GATE ELECTRODE

Francois M. Klaassen, and Johannes A. Appels, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 16, 1979, Ser. No. 4,003
Claims priority, application Netherlands, Jul. 24, 1978, 7807834
Int. Cl.² H01L *29/78*
U.S. Cl. 357—23 **8 Claims**

1. A field effect transistor with insulated gate electrode having a semiconductor body, said semiconductor body having first and second surfaces, oppositely located, comprising:

an island-shaped first region of a first conductivity type which adjoins said first surface;

a first zone of the second conductivity type within said

island shaped first region and likewise adjoining said first surface;

a second region of the second conductivity type which surrounds said first region and forms a pn junction therewith and adjoins said oppositely located second surface;

a groove in said first surface and extending through said first zone and said first region into said second region;

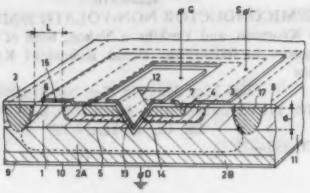
the wall of said groove being coated with an electrically insulating layer;

a gate electrode on said layer;

said first zone and said second region being provided with connection conductors associated with the source and drain electrodes of said field effect transistor;

a third region of said second conductivity type extending from said first surface to said second region;

said first region forming with said underlying second region



a first pn junction extending substantially parallel to said first surface and bounded laterally at least partly by said third region of the second conductivity type which extends from the first surface down to the second region and forms with the first region a second pn junction having a lower breakdown voltage than said first pn junction;

a fourth region of said first conductivity type adjoining said first surface present in said first region separating said first region and said first zone from each other and having a higher doping concentration than the first region; and

the doping concentration and the thickness of said first region being so small that when applying a voltage in reverse direction between said first and said second regions, the depletion zone of said transistor extends from said first pn junction up to said first surface throughout the thickness of said first region at a voltage which is lower than the breakdown voltage of said second pn junction.

4,233,618

INTEGRATED CIRCUIT WITH POWER TRANSISTOR

Robert C. Genesi, Sterling, Mass., assignor to Sprague Electric Company, North Adams, Mass.

Filed Jul. 31, 1978, Ser. No. 929,759

Int. Cl.³ H01L *29/72, 27/02, 27/04*

U.S. Cl. 357—35 **12 Claims**

1. An integrated semiconductor circuit having a high-current power transistor comprising:

(a) a semiconductor substrate of one conductivity type;

(b) an epitaxial layer of the opposite conductivity type on said substrate;

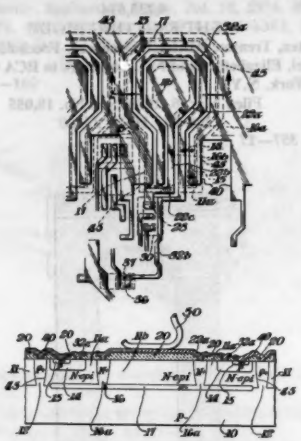
(c) a closed annular isolation-wall region of said one type being formed in said epitaxial layer, said wall region extending through said epitaxial layer from the outer surface thereof to the interface between said epitaxial layer and said substrate, defining within said epitaxial layer a pocket-region;

(d) an annular strip region of said one type being formed in said pocket region, extending from said surface only part way through said epitaxial layer, and being spaced inwardly from said wall region to serve as the base region of said transistor;

(e) an elongated region of said opposite type being formed within and along said strip region and extending to said surface to serve as the emitter of said transistor;

(f) a collector contact plug region of said opposite conductivity type being formed in a central portion of said pocket, being spaced inwardly from said annular strip region, extending from said surface through said epitaxial layer, and having at the periphery thereof a substantially greater electrical conductivity than that of the immediately adjacent portion of said pocket region;

(g) a metal collector-termination pad overlying and contacting said plug region at said surface, the periphery of said metal pad being substantially coincident with said periphery of said underlying plug region, said collector-termination pad having an area no smaller than 10^4 square microns;



(h) one metal layer contacting at said surface said elongated emitter region substantially along the entire length thereof; and

(i) another metal layer contacting at said surface said base strip region essentially along the entire length thereof, said another layer lying between and being spaced from said collector termination pad and said one metal layer.

4,233,619

LIGHT DETECTOR HOUSING FOR FIBER OPTIC APPLICATIONS

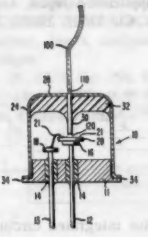
Paul P. Webb, Beaconsfield, and Robert J. McIntyre, Pointe-Claire, both of Canada, assignors to RCA Corporation, New York, N.Y.

Filed Oct. 30, 1978, Ser. No. 955,628

Claims priority, application Canada, Aug. 17, 1978, 309545

Int. Cl.² H01L *23/02, 27/14*

U.S. Cl. 357—74 **8 Claims**



1. In a light detector housing comprising

a header,

electrodes which are inserted through said header,

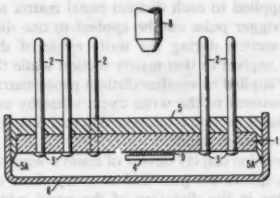
a light detector having a light sensitive surface mounted on one of said electrodes,
means for electrically connecting said light detector to said electrodes,
a cap bonded to said header which encloses said light detector, and
a window in said cap opposite to said light sensitive surface whereby light from an external light source impinging on said window enters said housing and impinges on said light sensitive surface,
the improvement which consists essentially of a light pipe inserted through an opening in said cap, bonded to said cap and extending from the outer surface of said cap toward said light sensitive surface whereby light from an external light source which impinges on said light pipe is transmitted toward said light sensitive surface with reduced spreading of the light beam.

4,233,620

SEALING OF INTEGRATED CIRCUIT MODULES

Russell E. Darrow, Newark Valley; Irving Memis, Vestal, and Richard M. Poliak, Endwell, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 27, 1979, Ser. No. 16,034
Int. Cl.³ H01L *23/10*
U.S. Cl. 357—74 **22 Claims**



1. An integrated circuit module containing a substrate having electrically-conductive pins protruding therefrom, and having attached to the backside thereof at least one integrated circuit chip wherein the improvement comprises providing a hermetical seal of the backside of the substrate contained within a cap with a composition over the substrate and a portion of the height of the pins containing:

(A) about 51.4 to about 60.6% by weight of an epoxy of at least about 95% of which being a diglycidyl ether of bisphenol A and epichlorohydrin, having an epoxy equivalent weight of about 180 to about 210 and a viscosity of about 6,500 to about 22,500 centipoise at 25° C.;

(B) about 39 to about 48% by weight of a hardener and flexibilizer portion containing

(1) about 15 to about 49% by weight of an anhydride hardener for said epoxy wherein said anhydride is selected from the group of nadic methyl anhydride, hexahydrophthalic anhydride, tetrahydrophthalic anhydride or mixtures thereof;

(2) about 40 to about 85% by weight of a polyglycol flexibilizer represented by the formula:

$$HO—R—O—[—R—O—]_n—R—OH$$

wherein R is a divalent saturated aliphatic hydrocarbon moiety selected from the group of ethylene, propylene, butylene, and mixtures thereof; and wherein n is 0 or an integer such that the molecular weight of said flexibilizer in conjunction with the amount employed is such that the viscosity of the hardener and flexibilizer portion is about 900 to about 2500 centipoise at 25° C.;

(3) 0.1 to about 1% by weight of a tertiary amine curing agent for the epoxy; and

(4) 0 to minor amounts of acid resulting from hydrolysis of said anhydride; wherein said minor amount is such that the acid number of the hardener and flexibilizer portion does not exceed about 4.0 mg KOH/gram; and wherein the amounts of B(1), B(2) and B(3) and B(4) are based upon the total of B(1), B(2), B(3) and B(4) of the hardener and flexibilizer portion; and

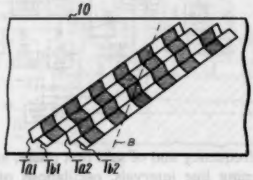
(C) 0 to about 0.6% by weight of a coloring agent.

4,233,621

METHOD AND APPARATUS FOR RECORDING AND REPRODUCING A COLOR-ALIGNED LINE-SEQUENTIAL COLOR VIDEO SIGNAL

Kazuo Yamagiwa, Tokyo, and Toshihiko Numakura, Kamakura, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 15, 1978, Ser. No. 960,838
Claims priority, application Japan, Nov. 21, 1977, 52-139622
Int. Cl.² H04N *5/79*
U.S. Cl. 358—8 **31 Claims**



1. A method of recording and reproducing in successive parallel tracks on a record medium a periodic information signal having information contained in successive line intervals, a predetermined number of line intervals being included in a field interval and a predetermined number of field intervals being included in a frame interval, said method comprising delaying alternate ones of said frame intervals by a time delay equal to an odd multiple of a line interval; adding an identifying signal to said video signal to identify the delayed and undelayed frame intervals; supplying, in sequence, the delayed and undelayed frame intervals of said periodic information signal together with said identifying signal to a recording transducer for recording in successive parallel tracks on said record medium; reproducing the recorded periodic information signal together with said identifying signal from successive parallel tracks to recover the delayed and undelayed frame intervals alternatively; identifying the delayed and undelayed frame intervals; and delaying the undelayed frame intervals by a time delay equal to said odd multiple of a line interval, thereby recovering said periodic information signal which is undelayed in successive frame intervals relative to each other.

4,233,622

SECAM-PAL CONVERTER

Willem H. Groeneweg, Ottenbach, Switzerland, assignor to RCA Corporation, New York, N.Y.

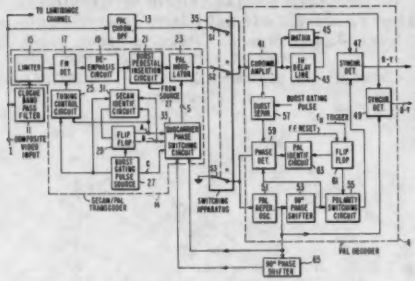
Filed Jan. 5, 1979, Ser. No. 1,166
Claims priority, application United Kingdom, Jan. 9, 1978, 658/78
Int. Cl.³ H04N *9/42*
U.S. Cl. 358—11 **6 Claims**

1. Apparatus for converting chrominance information encoded in SECAM fashion to a chrominance signal suitable for application to a PAL decoder, said chrominance information appearing during image portions of successive line intervals, said image portions of said line intervals following blanking portions thereof; said apparatus comprising:

frequency discriminator means, responsive to said chrominance information encoded in SECAM fashion, for sequentially developing, during image portions of successive line intervals, respective first and second color-difference signals;

a source of oscillations of a frequency corresponding to the standard PAL color subcarrier frequency; and

means, responsive to the output of said frequency discriminator means and the output of said source of oscillations, for developing an output chrominance signal comprising (a), during alternate line intervals, oscillations of said PAL color subcarrier frequency, having a first phase and modulated in amplitude in accordance with said first color-difference signal, and immediately preceded by substantially constant amplitude bursts of oscillations of said PAL color



subcarrier frequency and of said first phase, and (b), during intervening line intervals, oscillations of said PAL color subcarrier frequency, having a second phase differing from said first phase by 90° and modulated in accordance with said second color-difference signal, and immediately preceded by substantially constant amplitude bursts of oscillations of said PAL color subcarrier frequency and of a third phase differing from said first phase by 180°.

4,233,623

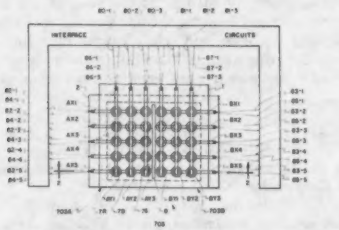
TELEVISION DISPLAY

Thomas J. Pavliscak, 2 S. 454 Seneca Dr., Wheaton, Ill. 60187

Continuation-in-part of Ser. No. 788,517, Apr. 18, 1977, abandoned. This application Dec. 8, 1978, Ser. No. 967,740

Int. Cl.[2] H04N *9/30*

U.S. Cl. 358—59 **44 Claims**



4. A single substrate X-Y electrodes matrix multiple gaseous discharge panel television device comprising:

an electrically non-conducting bottom substrate having a top and bottom surface;

a first array of parallel X-axis electrodes secured to the top surface of the substrate;

a first dielectric portion secured to the top surface of the substrate in overlaying relation to the parallel electrodes of the first array;

a second array of parallel Y-axis electrodes secured in overlaying relation to the first dielectric layer and physically separated by the first dielectric portion from the first array of X-axis electrodes, each Y-axis electrode of the second array being transverse to each X-axis electrode of the first array, the electrodes of each array being in a cross-over relation to the electrodes of the other array so as to define a panel matrix containing a multiplicity of X-Y gas discharge cell sites;

a further dielectric portion secured in overlaying relation to the second array of Y-axis electrodes;

a viewing top envelope transparent to visible light secured to the bottom substrate, said envelope being spaced above the second dielectric layer and discharge sites to provide an enclosed chamber for a gaseous medium;

a gaseous medium confined within the chamber;

the electrodes of at least one array being physically interrupted along one axis so as to divide the panel matrix into at least two distinct sections of gas discharge cells;

means for applying a trigger voltage pulse to each gas discharge cell site to initiate a sequence of gas discharge at each cell site;

means for applying a different maintain voltage pulse wave form to each distinct panel matrix section, the magnitude of each maintain voltage pulse being insufficient either to initiate a gas discharge at a cell site or to sustain a sequence of gas discharges at a cell site of relatively constant intensity for an indefinite length of time, the magnitude of each maintain voltage pulse being sufficient to support a sequence of diminishing gas discharges for a finite number of cycles, said gas discharges having been initiated by a trigger voltage pulse;

means for synchronizing the different maintain voltage wave forms applied to each distinct panel matrix section such that a trigger pulse can be applied to one distinct panel matrix section during the write cycle of the maintain voltage applied to that matrix section while the maintain voltage applied to another distinct panel matrix section is being restored to the write cycle whereby each distinct panel matrix section is addressed in real time response to a television video signal.

7. The television display device of claim 4 wherein a triad of different phosphors are provided at every three consecutive discharge sites in the direction of the panel width, the gas discharge at each of the three consecutive sites exciting a different phosphor which emits light of a different primary color (red, blue, or green).

4,233,624

COMBINED KINESCOPE GRID AND CATHODE VIDEO DRIVE SYSTEM

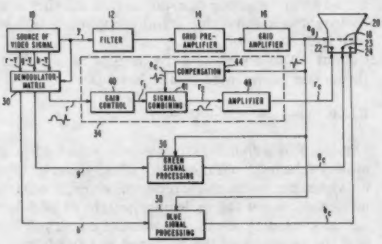
Werner Hinn, Zollikerberg, and Jürg Hinderling, Winterthur, both of Switzerland, assignors to RCA Corporation, New York, N.Y.

Filed Jul. 2, 1979, Ser. No. 53,908

Claims priority, application United Kingdom, Jul. 6, 1978, 29089/78

Int. Cl.[3] H04N *9/20*

U.S. Cl. 358—65 **13 Claims**



1. In a system for processing a color image representative video signal containing low and high frequency components, said system including a kinescope having an electron gun assembly comprising first and second intensity control electrodes for reproducing an image in response to video signals

applied to said electrodes, a kinescope driver amplifier arrangement comprising:

means for passing selected high frequency components of said video signal above a given frequency;

first amplifier means responsive to said selected high frequency components for supplying amplified, selected high frequency components to said first kinescope electrode;

means for combining said selected high frequency components and said color representative video signal including said low and high frequency components, with a sense to significantily attenuate said high frequency component of said video signal at an output of said combining means; and

second amplifier means responsive to output signals from said combining means for supplying amplified video signals to said second kinescope electrode.

4,233,625

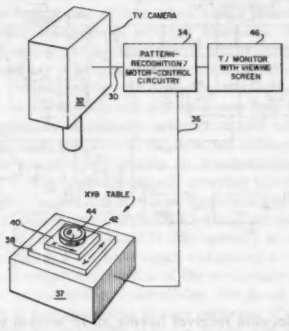
TELEVISION MONITORING SYSTEM FOR AUTOMATICALLY ALIGNING SEMICONDUCTOR DEVICES DURING MANUFACTURE

Norman G. Altman, Stamford, Conn., assignor to Teledyne, Inc., Los Angeles, Calif.

Filed Nov. 3, 1978, Ser. No. 957,488

Int. Cl.³ H04N *7/00;* **G01B** *11/00, 9/00;* **G06K** *9/00*

U.S. Cl. 358—101 **27 Claims**



1. For use in a system for aligning successive like semiconductor configurations, each characterized by a set of perpendicularly intersecting visual elements, said system comprising table means for adjustably carrying and optically presenting any one of said semiconductor configurations, drive means for causing said table motions in X, Y, and θ directions, television camera means directed toward said table means for viewing any one of said semiconductor configurations on said table means, said television camera means being characterized by a raster of scan lines and producing pattern recognition signals corresponding to said scan lines, and television monitor means characterized by a raster of scan lines for displaying a representation of any one of said semiconductor configurations being carried on said table means:

(a) electronic control means operatively connected between said television camera means and said table means and between said television camera means and said television monitor means;

(b) said electronic control means including memory means for storing representations of said pattern recognition signals;

(c) manual supervision means for energizing said drive means in order to align a set of perpendicularly intersecting visual elements on a reference one of said semiconductor configurations, thereby generating reference pattern recognition signals and storing reference representations thereof in said memory means; and

(d) automatic supervision means for comparing pattern recognition signals generated from a semiconductor configuration to be aligned on said table means and reference pattern recognition signals corresponding to said reference representations in said memory means, thereby energizing said drive means for aligning said set of perpendicular elements on said semiconductor configuration to be aligned.

4,233,626

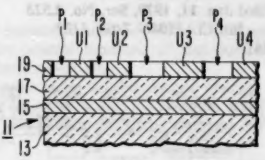
PLAYBACK INFORMATION RECORD USING PHASE CANCELLATION FOR READING

Alan E. Bell, East Windsor, N.J., assignor to RCA Corporation, New York, N.Y.

Division of Ser. No. 782,035, Mar. 28, 1977, abandoned. This application Jan. 11, 1979, Ser. No. 2,725

Int. Cl.² H04N *5/76;* **G11B** *7/24;* **G01D** *15/34*

U.S. Cl. 358—128.5 **6 Claims**



1. An information record, for use in playback apparatus employing a playback beam of light of a given frequency; said record comprising:

a substrate having a light reflective surface;

a layer of light transparent material overlying said reflective surface; and

a layer of light reflective material, having an information track formed therein, overlying said light transparent layer;

wherein said information track comprises a succession of spaced pits and intervening land areas with variations in the spacing between successive pit edges representative of recorded information; and

wherein the thickness of said layer of light transparent material in those layer regions occupied by said pits is such as to introduce a phase change of approximately $(2K+1)\pi$ radians between portions of said beam which respectively fall on said pits and said intervening land areas at said given frequency, where k is zero or any integer.

4,233,627

SIGNAL MULTIPLEXING SYSTEM

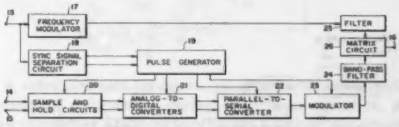
Yasumasa Sugihara, Kawasaki, Japan, assignor to The General Corporation, Kanagawa, Japan

Filed Aug. 8, 1978, Ser. No. 931,916

Claims priority, application Japan, Aug. 9, 1977, 52/95224

Int. Cl.² H04N *7/04*

U.S. Cl. 358—143 **6 Claims**



1. In a system for multiplexing a frequency modulated composite television video signal and a PCM multiplexed audio signal composed of pulse code modulated time division multiplexed audio signals, wherein the PCM multiplexed audio signal has a frame repetition frequency or sampling frequency f_s which is related to the horizontal sync frequency f_h of the composite video signal by the following expression:

$f_x = f_h = (n/m)$

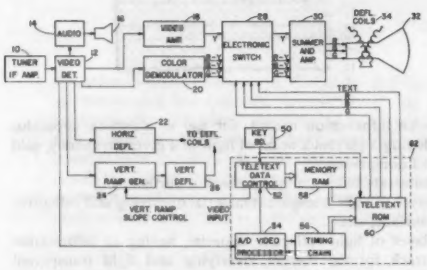
where m represents a selected integer which represents a divisor of number of scanning lines per frame of the composite video signal and n represents a selected positive integer: means for multiplexing the PCM multiplexed audio signal with the composite video signal in a manner such that the start of the initial frame has a given timing relationship relative to the vertical sync signal of a selected one of an odd- and even-numbered field of the composite video signal.

4,233,628

NTSC RECEIVER USEABLE WITH TELETEXT/VIEWDATA INFORMATION

Walter S. Ciciora, Park Ridge, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Jan. 11, 1979, Ser. No. 2,523
Int. Cl.³ H04N *7/08, 3/22*
U.S. Cl. 358—147 **13 Claims**



1. An NTSC television receiver capable of normally displaying approximately 200 horizontally lines of video information per field including;

signal synthesis means for generating Teletext video information from coded digital signals received during the vertical intervals of normal television broadcast signals, said Teletext information having a format embracing approximately 240 horizontal scan lines per field; and

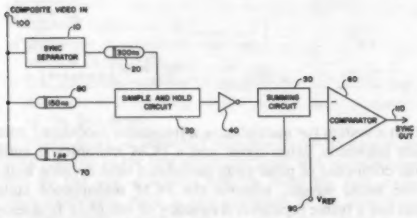
raster control means for altering the raster of said television receiver to display more than the normal number of horizontal lines and thereby enable direct use of said Teletext information.

4,233,629

SYNC SEPARATOR WITH A LOOK-AHEAD CLAMP

Birney D. Dayton, Nevada City, Calif., assignor to The Grass Valley Group, Grass Valley, Calif.

Filed Feb. 5, 1979, Ser. No. 9,194
Int. Cl.³ H04N *5/08*
U.S. Cl. 358—153 **23 Claims**



1. A sync separator comprising:

first means for separating a sync signal from an input composite video signal;

first means for receiving and delaying said input composite video signal;

a sample-and-hold circuit coupled to said first separating means and said first receiving and delaying means, the output of said sample-and-hold circuit being a sample of said delayed composite video signal;

second means for receiving and delaying said input composite video signal coupled to a summing point;

an inverter coupled to receive and invert said sample, the output of said inverter being coupled to said summing point; and

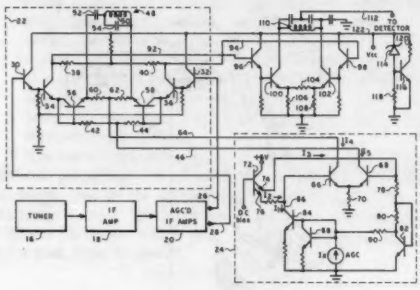
second means for separating a sync signal coupled to receive the output of said summing point.

4,233,630

CIRCUIT FOR MODIFYING THE IF RESPONSE OF A TELEVISION RECEIVER

Roy F. Baker, Franklin Park, and Frank Banach, Oak Lawn, both of Ill., assignors to Zenith Radio Corporation, Glenview, Ill.

Filed Sep. 4, 1979, Ser. No. 72,397
Int. Cl.³ H04N *5/21*
U.S. Cl. 358—167 **10 Claims**



1. In a television receiver having an IF section which processes IF signals having a picture carrier component and which substantially determines the IF frequency response of the receiver under normal signal conditions, a circuit for modifying the IF frequency response under low level signal conditions, comprising:

an amplifier having an IF signal input and a load impedance across which the IF signal is amplified;

a first selectable gain-degeneration impedance having a relatively constant impedance at IF frequencies, including the frequency of the picture carrier;

a second selectable gain-degeneration impedance having a relatively lower impedance at the frequency of the picture carrier, said degeneration impedances being coupled to said amplifier such that the amplifier's gain is dependent on the ratio of its load impedance to the selected degeneration impedance and such that each of said first and second impedances is selectable in response to a current being steered therethrough; and

means responsive to the receiver receiving a relatively high level television signal for steering current through said first degeneration impedance so as to effect wideband gain of said amplifier, and responsive to the receiver receiving a relatively low level television signal for steering current through said second degeneration impedance so as to effect increased gain at the frequency of the picture carrier,

whereby the receiver's IF frequency response is substantially unaltered when high level television signals are received and the frequency response is altered when low

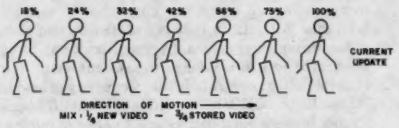
level television signals are received so as to provide increased gain at the frequency of the picture carrier.

4,233,631

TELEVISION SYSTEM FOR DISPLAYING AND RECORDING PATHS OF MOTION

Henry W. Mahler, Newtown, Conn., assignor to CBS Inc., New York, N.Y.

Filed Oct. 4, 1978, Ser. No. 948,362
Int. Cl.³ H04N 5/22
U.S. Cl. 358—182 **8 Claims**



1. Apparatus for generating from arriving television signals, video signals for displaying simultaneously a succession of images of an object moving in an otherwise substantially static scene, said apparatus comprising:

storage means for storing a reference field of video representing said scene at an operator controllable start time;

means for comparing picture elements of selectable time-separated subsequently arriving television fields with corresponding picture elements of said reference field;

means operative in response to detection of differences between corresponding picture elements of said subsequently arriving fields and said reference field for tagging and storing those picture elements of said subsequently arriving fields that caused the detected difference;

means for successively mixing in synchronism with the arrival of selected subsequently arriving television fields previously tagged and stored picture elements that caused detected differences with corresponding picture elements of each of the said selectable subsequently arriving fields and producing a resultant signal containing a controllable fractional amplitude portion of the previously stored picture elements and a controllable fractional amplitude portion of corresponding picture elements of each of the selectable subsequently arriving fields and storing the resultant signal with said previously tagged and stored picture elements; and

means connected to receive said tagged and stored picture elements and said subsequently arriving video fields for continuously providing for display, following the said start time, output video signals representing said scene with the substitution therein of those picture elements representing a controllable number of images of said moving object preceding the current image thereof, and in which said images progressively decrease in intensity in the direction toward the earlier image positions of the moving object.

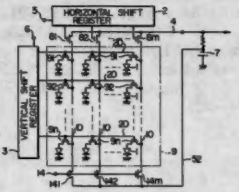
4,233,632

SOLID STATE IMAGE PICKUP DEVICE WITH SUPPRESSED SO-CALLED BLOOMING PHENOMENON

Toshiyuki Akiyama, Kokubunji, Japan, assignor to Hitachi, Ltd., Japan

Filed Oct. 26, 1978, Ser. No. 954,863
Claims priority, application Japan, Nov. 7, 1977, 52/148311[U]; May 19, 1978, 53/66554[U]; Jun. 23, 1978, 53/85372[U]
Int. Cl.³ H04N 3/12
U.S. Cl. 358—212 **6 Claims**

1. A solid state image pickup device including a plurality of photo-electric elements arrayed in a matrix-like configuration, vertical switching elements each associated with each of said photo-electric elements for reading out electric charge stored therein, a vertical scanning circuit for supplying control pulses to control terminals of said vertical switching elements, common vertical output conductors each for connecting together output terminals of those of said vertical switching elements which are arrayed on the same column of said matrix-like configuration, horizontal switching elements for read out connected to respective one ends of said vertical output conductors, and a horizontal scanning circuit for supplying control pulses to the control terminals of said horizontal switching elements, further including:



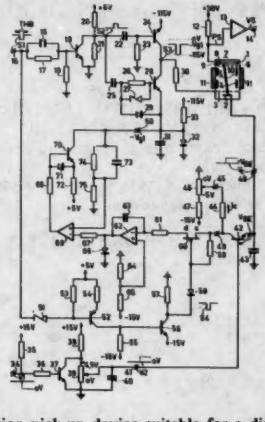
means for removing surplus electric charges at said photo-electric elements by varying potential at the control terminals of said vertical switching elements during a blanking period.

4,233,633

TELEVISION PICK-UP DEVICE SUITABLE FOR A DISCONTINUOUS RECORDING OF INFORMATION DURING CONTINUOUS OPERATION

Rudolf Kemner, and Rudy R. Cramer, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 22, 1978, Ser. No. 972,604
Claims priority, application Netherlands, Jun. 5, 1978, 7806074
Int. Cl.³ H04N 5/34, 5/32
U.S. Cl. 358—221 **6 Claims**



1. A television pick-up device suitable for a discontinuous recording of information during continuous operation, the device comprising a pick-up tube having a cathode for generating an electron beam, a control electrode for controlling the electron beam current strength, and a target plate which is scanned line-by-line and field-by-field by the electron beam by means of deflection means, wherein the pick-up device further comprises a supply circuit coupled to the cathode of the pick-up tube, said supply circuit having means for providing a first voltage level to the cathode when information is being recorded by said pick-up device, and a second voltage level to

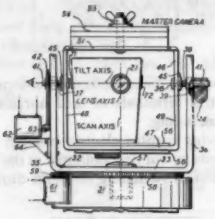
the cathode when information is not being recorded, said second voltage level being higher than said first voltage level, whereby said second voltage level prevents said target plate from becoming more negative when information is not being recorded.

4,233,634

VIDEO CAMERA WITH ADJUSTABLE MOUNT AND COUNTERBALANCE

Jay W. Adams, 937 E. Groton Dr., Burbank, Calif. 91504

Filed Jun. 22, 1979, Ser. No. 51,019
Int. Cl.³ H04N *5/24, 5/26*
U.S. Cl. 358—229 **10 Claims**



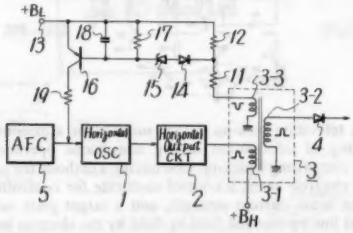
1. A camera support for a video camera having a lens axis and color receptors axes intersection point and comprising a vertical axis pivot for said support, a camera cradle, means for securing said camera to said cradle, means for horizontally adjusting said cradled camera with respect to said support such that a vertical axis pivot extension passes through said camera axes intersection point, transversely aligned horizontal cradle mount pivots on said camera support, transversely spaced pivot receivers on said cradle, means for adjusting said cradle vertically with respect to said mount pivots such that a horizontal pivot axis extension passes through said camera axes intersection point, and bias means for counterbalancing said camera with respect to said transversely aligned horizontal pivots.

4,233,635

HIGH VOLTAGE LIMITING CIRCUIT FOR A TELEVISION RECEIVER

Masao Suzuki, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Dec. 4, 1978, Ser. No. 966,128
Claims priority, application Japan, Dec. 7, 1977, 52/164302[U]
Int. Cl.³ H04N *5/68*; H01J *29/70*
U.S. Cl. 358—243 **5 Claims**



1. A high voltage limiting circuit for a television receiver comprising:

a horizontal oscillator for providing an output pulse having a frequency controlled by an automatic frequency control voltage;

an output circuit driven by said output pulse from said horizontal oscillator to provide an output pulse signal;

a fly-back transformer having a primary winding receiving said output pulse signal from said output circuit, a secondary winding and a tertiary winding;

a high voltage rectifying circuit connected to said secondary winding of said fly-back transformer;

a source of a reference potential;

a voltage divider connected between said tertiary winding and said source of reference potential;

a constant voltage device; and

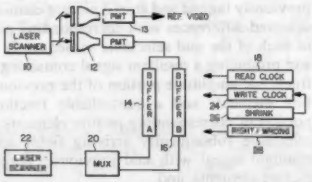
a transistor having an emitter connected to said source of reference potential, a base connected to said voltage divider through said constant voltage device and a collector connected to add a voltage to said automatic frequency control voltage controlling said frequency of said horizontal oscillator; said tertiary winding of said fly-back transformer being wound to produce a negative pulse and said reference potential being a positive voltage whereby the added voltage is effective to control the frequency of said horizontal oscillator so as to reduce a high voltage obtained at said high voltage rectifying circuit when a voltage of said negative pulse exceeds a predetermined value.

4,233,636

OPTICAL READ-WRITE SYSTEM WITH ELECTRONICALLY VARIABLE IMAGE SIZE

Steven K. Harbaugh, El Toro, and Gary H. Hoogerbrugge, Placentia, both of Calif., assignors to Eocom Corporation, Irvine, Calif.

Filed Jul. 3, 1978, Ser. No. 921,763
Int. Cl.³ H04N *1/02*
U.S. Cl. 358—287 **13 Claims**



1. An optical read-write system for scanning an object and reproducing an image which may vary in size from said object comprising:

first laser means for linearly scanning an object at a scan rate and a photo multiplier tube for generating an electrical image signal for each scan,

means for generating a read clock signal having a read frequency and generating a write clock signal having a write frequency, said means for generating a read clock signal and a write clock signal including

a source of a reference signal,

a phase comparator for receiving said reference signal and a feedback signal and producing a control voltage based on a comparison of said reference signal and said feedback signal,

a voltage controlled oscillator having a control terminal, means connecting said control voltage from said phase comparator to said control terminal whereby said oscillator generates a pulse signal at a frequency dependent on said control voltage,

pulse removal means connected to receive said oscillator signal and controllable to produce an output signal in which a variable number of pulses of said oscillator signal may be removed,

frequency divider means connected to receive said output signal from said pulse removal means and produce a di-

vider output signal at a frequency lower than said oscillator signal frequency,

means for applying said divider output signal to said phase comparator as said feedback signal, said write clock signal being derived from said oscillator signal and said read clock signal being derived from said output signal produced by said pulse removal means,

means for storing said electrical image signal at said read frequency in synchronization with the scan of said means for optically scanning, and

second laser means for receiving said stored electrical image signal and linearly scanning at said scan rate for displaying an image at said write frequency.

4,233,637

ROTATING MAGNETIC HEAD PIEZO-ELECTRIC ASSEMBLY AND DRIVE CIRCUITRY FOR VIDEO TAPE RECORDER

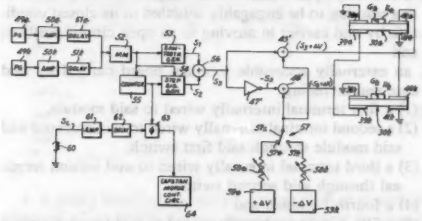
Yukio Kubota, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jan. 16, 1979, Ser. No. 3,974

Claims priority, application Japan, Jan. 17, 1978, 53-2710

Int. Cl.³ G11B *21/10, 21/18*

U.S. Cl. 360—10 **12 Claims**



1. The combination of a magnetic head assembly comprising piezo-electric support means of elongated plate-like configuration having opposed major surfaces and being supported at one end, a magnetic head mounted on said support means adjacent the other end thereof, and pairs of first and second electrodes secured on said opposed major surfaces, respectively, and extending in the direction between said one and other ends of the support means with said pair of electrodes being parallel and spaced from each other in the direction transverse to said direction between the ends; and drive circuit means for applying selectively varied voltages across said first and second electrodes of said pairs and by which said piezo-electric support means is selectively made to flex for deflecting said head in a direction substantially normal to the plane of said plate-like support means and for varying the azimuth angle of said head, said drive circuit means including means connecting said first electrode of one of said pairs and said second electrode of the other of said pairs to ground, a source of a variable control voltage, means for providing a reversed polarity replica of said variable control voltage, means for providing each of said variable control voltage and said reversed polarity replica thereof with a selectively varied D.C. voltage bias, and means for applying said variable control voltage with said D.C. voltage bias and said reversed polarity replica with said D.C. voltage bias to said second and first electrodes, respectively, of said one pair and said other pair, respectively, of the electrodes.

4,233,638

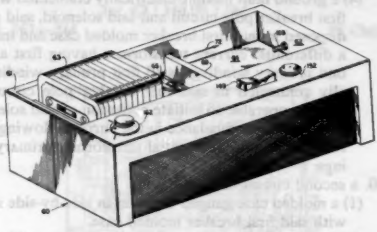
CASSETTE SUBSTITUTION APPARATUS

Fred C. Bolick, Jr.; Theodore Titus, IV, and Said Mohammadioun, all of Altanta, Ga., assignors to Lanier Business Products, Inc., Atlanta, Ga.

Continuation of Ser. No. 753,361, Dec. 22, 1976, abandoned, which is a division of Ser. No. 554,476, Mar. 3, 1975, Pat. No. 4,024,354, which is a continuation of Ser. No. 327,501, Jan. 29, 1973, abandoned. This application Jan. 22, 1979, Ser. No. 5,089

Int. Cl.³ G11B *19/00, 15/18;* H04M *11/10*

U.S. Cl. 360—92 **2 Claims**



1. Cassette recording apparatus having a plurality of operational modes for causing tape movement in a cassette in a recording interrelationship with a transducer, one of said plurality of operational modes being a recording mode of operation for causing tape movement in response to a selectively operable tape forward signal, wherein the improvement comprises:

a first means for sensing a predetermined amount of remaining tape available for recording in a first cassette in recording interrelationship with said transducer when said cassette recording apparatus is in a recording mode of operation for causing tape movement; and

a second means operative in response to said first means for substituting a second cassette for said first cassette a predetermined period of time after said first means senses said predetermined amount of remaining tape available for recording;

wherein said second means is operative independently of the presence or absence of said tape forward signal subsequent to said first means sensing said predetermined amount of remaining tape.

4,233,639

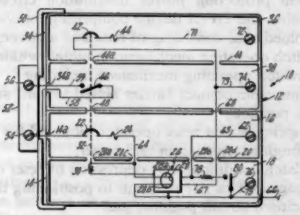
APPARATUS AND SYSTEM FOR PROTECTING POWER DISTRIBUTION CIRCUITS AGAINST GROUND FAULTS

Keith W. Klein, Simsbury; Joseph M. Palmieri, and Gregory C. Eckart, both of Southington, all of Conn., assignors to General Electric Company, New York, N.Y.

Filed Mar. 26, 1979, Ser. No. 24,228

Int. Cl.³ H02H *3/347*

U.S. Cl. 361—44 **8 Claims**



1. A ground fault circuit interrupting (GFCI) device for utilization in a system protecting an electrical power distribu-

tion circuit against ground faults, said GFCI device comprising, in combination:

A. a first circuit breaker including:

(1) a molded case,

(2) first breaker contacts disposed in said first breaker molded case and serially connected in a first breaker internal pole circuit extending between first and second externally excessible GFCI device terminals,

(3) a trip solenoid disposed in said first breaker molded case and electrically connected with said first breaker pole circuit,

(4) a ground fault module electrically connected with said first breaker pole circuit and said solenoid, said module disposed in said first breaker molded case and including a differential current transformer having first and second primary windings, said first primary winding serially connected in said first breaker pole circuit, said module operable to initiate actuation of said solenoid in response to an imbalance in the currents flowing in said first and second differential transformer primary windings;

B. a second circuit breaker having

(1) a molded case ganged together in side-by-side relation with said first breaker molded case,

(2) second breaker contacts disposed in said second breaker molded case and serially electrically connected with said second differential transformer primary winding in a second breaker internal pole circuit extending between said first and second breaker molded cases from a third externally excessible GFCI device terminal to a fourth externally excessible GFCI device terminal, said second breaker pole circuit also connected to said module, and

(3) a switch disposed in said second breaker molded case and electrically connected in series between said first GFCI device terminal and a fifth externally excessible GFCI device terminal;

C. an internal common trip bar extending between said first and second breaker molded cases, said common trip bar operatively coupling said trip solenoid with said first and second breaker contacts and said switch such that actuation of said solenoid trips said first and second breaker contacts open and actuates said switch;

D. a sixth externally excessible GFCI device terminal electrically connected to said second breaker pole circuit at a point intermediate said second breaker contacts and said second differential transformer primary winding.

4,233,640

GROUND FAULT APPARATUS AND PROTECTION SYSTEM

Keith W. Klein, Simsbury; Joseph M. Palmieri, and Gregory C. Eckart, both of Southington, all of Conn., assignors to General Electric Company, New York, N.Y.

Filed Mar. 26, 1979, Ser. No. 24,229

Int. Cl.³ H02H 3/347

U.S. Cl. 361—44 **11 Claims**

1. A ground fault circuit interrupting (GFCI) device for use in a system protecting power distribution circuits against ground faults, said GFCI device comprising, in combination:

A. a molded case consisting of base and a cover;

B. a switch operating mechanism mounted within said case, said switch operating mechanism including

(1) a movable contact carrier biased toward an open circuit position,

(2) a spring biased reset operator mounted for protrusion through an opening in said cover,

(3) a latch conditioned by depression of reset operator to engage said carrier pursuant to positioning the latter to its closed circuit position, and

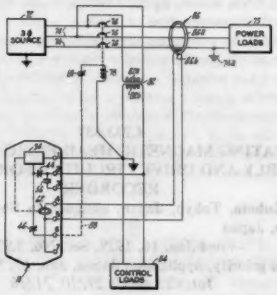
(4) a solenoid operable upon electrical energization to disengage said latch from said carrier, whereupon said carrier springs to its open circuit position.

C. a first switch consisting of a first stationary contact mounted within said case and a first movable contact mounted by said carrier, said first stationary and movable contacts being engaged while said carrier is in its closed circuit position and disengaged while said carrier is in its open circuit position;

D. a ground fault module mounted within said case, said module including

(1) a current transformer having at least one primary winding, and

(2) electronic means responsive to a net primary current excitation of said transformer for initiating energization of said solenoid pursuant to unlatching said carrier for movement to its open circuit position;



E. a normally open second switch disposed within said case in a position to be engagably actuated to its closed condition by said carrier in moving to its open circuit position; and

F. an externally accessible terminal board carried by said case and including

(1) a first terminal internally wired to said module,

(2) a second terminal internally wired to said solenoid and said module through said first switch,

(3) a third terminal internally wired to said second terminal through said second switch,

(4) a fourth terminal, and

(5) a fifth terminal internally wired to said fourth terminal through said one transformer primary winding.

4,233,641

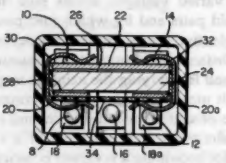
LINE PROTECTOR FOR A COMMUNICATIONS CIRCUIT

Bertram W. Baumbach, Arlington Heights, Ill., assignor to Reliable Electric Company, Franklin Park, Ill.

Filed Apr. 6, 1979, Ser. No. 27,680

Int. Cl.³ H02H 3/22

U.S. Cl. 361—119 **6 Claims**



1. A line protector comprising an insulating base, line pins projecting through said base for connection to a line to be protected, and a terminal for connection to ground; a surge voltage arrester of the semi-conductor type that has a resistance that decreases as increasing voltage is applied thereacross and which heats excessively in an overcurrent surge

condition on the protected line, said arrester comprising opposed surfaces forming terminal portions one of which is in electrical connection with said ground terminal, the other terminal portion being in electrical connection with the line pins, and means forming a normally open shunt circuit between said opposed terminals but operable to close and thereby ground the line in the event of a surge condition on the line that causes said overcurrent condition, said shunt circuit comprising resilient electrically conductive means biased toward at least one of said terminal portions, a dielectric member in thermally conducting relation with said surge arrester, said resilient means being prevented from contacting said one terminal portion by said dielectric member except when an overcurrent condition that heats the semi-conductor a sufficient amount to melt said dielectric member.

4,233,642

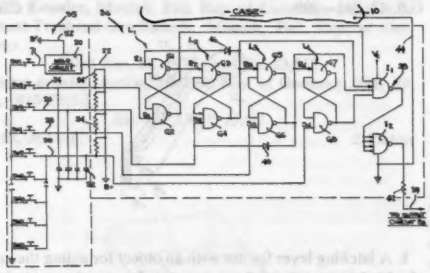
SAFETY INTERLOCK SYSTEM

Thomas R. Ellsberg, 6339 Coldwater Canyon, North Hollywood, Calif. 91606

Continuation-in-part of Ser. No. 866,287, Jan. 3, 1978, abandoned, which is a continuation-in-part of Ser. No. 709,314, Jul. 28, 1976, abandoned. This application Jan. 29, 1979, Ser. No. 7,359

Int. Cl.³ H01H *47/32*

U.S. Cl. 361—172 **41 Claims**



1. A safety interlock system to prevent theft or unauthorized removal of a vehicle having an engine system for powering said vehicle with an electrical component forming part of the engine system, said interlock system comprising:

(a) a plurality of manually operable switch elements, each representing a separate indicium of a code for energizing said interlock system to enable operation of said vehicle when a plurality of said switch elements have been actuated in proper sequence to conform to the preestablished sequence of indicia of said code,

(b) means operatively associated with said switch elements to generate an electrical signal in response to actuation of said switch elements,

(c) a plurality of electronic latches, each of said latches being connected in operative relation to certain of said switch elements and in such arrangement that said latches are switched to a proper state to generate an enabling signal in response to said electrical signals only when said switch elements are operated in proper sequence to conform to the preestablished sequence of indicia of said code,

(d) a solid state circuit component associated with the electrical component and being connected to the output of said latches, and being operable in response to said enabling signal to thereby permit operation of said electrical component, and

(e) a locking circuit operatively connected to the output of said latches and operating in conjunction with an electrically operable lock release mechanism located to permit locking and opening of an access means to a compartment of said vehicle, said locking circuit generating a signal to actuate said lock release mechanism and permit opening of said access means when an enabling signal is generated and to prevent opening of said access means when said enabling signal is not generated.

4,233,643

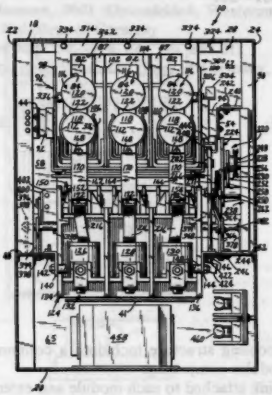
ELECTRICAL POWER SWITCHING APPARATUS WITH SLIDING FUSE DRAWER AND INTERLOCK SYSTEM

James R. Iverson, Fridley, and Derrick N. Alcock, Bloomington, both of Minn., assignors to Electric Machinery Mfg. Company, Minneapolis, Minn.

Filed Nov. 22, 1978, Ser. No. 963,162

Int. Cl.³ H02B *1/04*

U.S. Cl. 361—344 **55 Claims**



1. A switching apparatus for use in an electrical control device comprising:

a housing having a switching section and a bus section, said bus section having at least one bus member for supplying incoming electrical current;

a fuse chassis attached to said housing for reciprocal movement into and out of the switching section of said housing;

means holding at least one fuse in said fuse chassis;

a contactor mechanism supported in the switching section of said housing forward of said bus section and vertically away from said fuse chassis for connecting and disconnecting flow of current from said at least one bus member to an electrically actuated device, said contactor mechanism being movable between an activated and a deactivated position wherein current is capable of flowing from said at least one bus member to the electrically activated device in said activated position but not in said deactivated position;

first connector means for connecting a first end of said at least one fuse to said at least one bus member, said first connector means including a discrete bus contact connected to said at least one bus member and a first descrete fuse contact engaging a first end of said at least one fuse, said first fuse contact being located at the rearward end of said fuse chassis;

second connector means for connecting a second end of said at least one fuse to said contactor mechanism, said second connector means including a second discrete fuse contact for engaging a second end of said at least one fuse and a discrete contactor contact for connecting said second fuse contact to said contactor mechanism;

a door attached to a front face of said housing for pivotal motion between an open and a closed position; and

means for moving said fuse chassis between an engaged position and an isolated position, said first and second connector means connecting said at least one fuse between said at least one bus member and said contactor mecha-

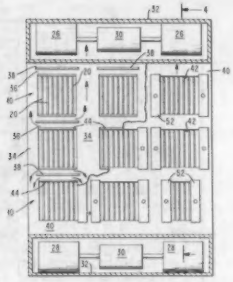
nism in said engaged position and said at least one fuse being disconnected from both said at least one bus member and said contactor mechanism in said isolated position, said fuse chassis moving means being actuated from outside said housing.

4,233,644

DUAL-PULL AIR COOLING FOR A COMPUTER FRAME

Un-Pah Hwang, and Robert E. Simons, both of Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 28, 1979, Ser. No. 52,998
Int. Cl.³ H05K *7/20*
U.S. Cl. 361—384 **11 Claims**



1. Air cooling structure including a column of integrated circuit modules comprising:

a heat sink attached to each module and extending from the top side thereof and having air outlets at opposite ends thereof;

a cover plate having openings therein indexed with each of said heat sinks to allow air to pass through the openings into the heat sinks;

an air flow guide located at the air outlet sides of said heat sinks extending from said cover plate into said heat sink to approximately the halfway point to provide a vertical impinging air flow pattern which yields a high heat transfer coefficient;

air distribution ducts connected to the opposite outlet sides of each of said heat sinks thereby providing a dividing of the flow across each heat sink;

a pair of air moving devices, one located at one end of said air distribution ducts and the other at the other end of said air distribution ducts, each pulling air through said modules.

4,233,645

SEMICONDUCTOR PACKAGE WITH IMPROVED CONDUCTION COOLING STRUCTURE

Demetrios Balderes, Wappingers Falls; John R. Lynch, Hopewell Junction, and Robert A. Yacavonis, Poughkeepsie, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

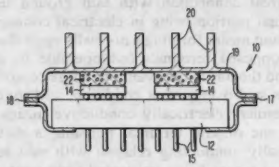
Filed Oct. 2, 1978, Ser. No. 947,788
Int. Cl.³ H05K *7/20*
U.S. Cl. 361—385 **1 Claim**

1. In a semiconductor device package having a substrate, at least one semiconductor device mounted on the top surface of the substrate, a heat sink having a surface in spaced relation to the top surface of the substrate, the improvement comprising,

at least one heat transfer member positioned between said device and said surface of said heat sink,

said heat transfer member comprised of a porous block of material, and

a heat conductive non-volatile low viscosity, high surface tension, liquid permanently retained within said block of material and in contact with said device by capillary action,



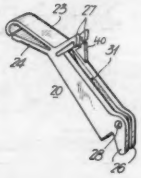
said heat transfer member operative to transfer heat by conduction from said device to said heat sink without changing phase.

4,233,646

LATCHING LEVER FOR PRINTED CIRCUIT BOARDS

Ernest C. Leung, Ottawa, and Isaac R. Revah, Willowdale, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Jul. 30, 1979, Ser. No. 61,689
Claims priority, application Canada, Jun. 29, 1979, 330868
Int. Cl.³ H05K *1/18*
U.S. Cl. 361—399 **9 Claims**



1. A latching lever for use with an object for aiding the entry of said object into a mating apparatus, for securing said object in said mating apparatus, and for aiding the removal of said object from said mating apparatus, said latching lever characterized by:

a body portion for pivotal connection to said object, about a pivot point;

a hooked portion, flexibly mounted to said body portion, and projecting therefrom at the end of said body portion remote from said pivot point, for engaging a projection attached to said object;

an actuating member, solidly connected to said hooked portion and protruding therefrom, for moving said hooked portion relative to said body portion, so as to selectively disengage said hooked portion from said projection;

a stop portion, solidly connected to said body portion and protruding therefrom, located adjacent said actuating member, but spaced therefrom so as to provide a limit to the movement of said actuating member.

4,233,647

PHOTOGRAPHIC ACCESSORY APPARATUS

Axel B. Andersen, 1923 Morena Blvd., San Diego, Calif. 92110

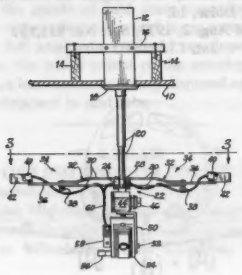
Filed Aug. 25, 1978, Ser. No. 936,752
Int. Cl.³ G03B *15/02*
U.S. Cl. 362—16 **6 Claims**

1. A photographic accessory assembly for illuminating an area to be photographed, said accessory comprising:

(a) a mounting means;

(b) a directional high intensity light source mounted on said

mounting means and directed substantially away from said area to be photographed;



(c) a reflective light diffusion screen mounted adjacent said high intensity light source and angled to reflect diffused light from said source onto said area to be photographed.

4,233,648

ADJUSTABLE DIRECT AND BOUNCE PHOTOFLASH UNIT

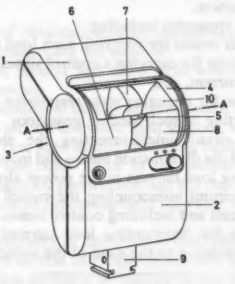
Udo M. Geissler, Munich, Fed. Rep. of Germany, assignor to Patent-Treuhand-Gesellschaft, Munich, Fed. Rep. of Germany

Filed Apr. 26, 1979, Ser. No. 33,537

Claims priority, application Fed. Rep. of Germany, May 19, 1978, 7815176[U]

Int. Cl.³ G03B *15/02*

U.S. Cl. 362—17 **3 Claims**



1. Flash illumination apparatus usable selectively for full or variably partial direct illumination comprising, in combination:

a casing consisting of two box-like bodies having the same rectangular cross-sectional dimensions, pivoted one on the other on an axis parallel to the width dimension of said bodies lying on the median plane of both of them;

a flash tube centered on said axis running substantially across said casing;

a cylindrical transparent window of variable width having a cylindrically formed sheet of transparent material mounted on one of said bodies and fitted in an opening and a mounting in both of said bodies so as to maintain a window centered on said flash tube over a range of relative positions of said two bodies obtainable by pivoting one on the other;

a mounting foot on one of said bodies at the end thereof remote from the connection to the other of said bodies;

a centrally disposed reflector substantially in the shape of a parabolic cylinder having said axis as its focal line and affixed to one of said bodies, and

a pair of reflectors located on either side of said central reflector and substantially in the shape of parabolic cylinders having said axis as the respective focal lines thereof, said pairs of reflectors being fixed on the one of said bodies other than the one on which said central reflector is fixed, whereby manual tilting of that one of said bodies other than the one on which foot is affixed determines the amount of deviation of light projected from said flash tube by said pair of reflectors from the light projected by said central reflector when said flash tube is operated.

4,233,649

TREATMENT CHAIR WITH COOL-LIGHT LAMP FOR DENTAL MEDICINAL PURPOSES

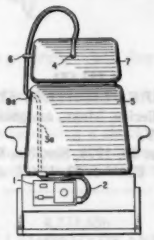
Peter Scheer, Wandsbeker Markststr. 91, 2000 Hamburg 70, and Arnold Hamann, 2061 Ahrensfelde4, Westerau-Ahrensfelde, both of Fed. Rep. of Germany

Filed Mar. 30, 1978, Ser. No. 891,811

Claims priority, application Fed. Rep. of Germany, Sep. 27, 1977, 7736502

Int. Cl.² F21V *7/04*

U.S. Cl. 362—32 **5 Claims**



1. Lamp assembly for dental-medical and similar purposes including a treatment chair having a first part and a second part movably displaceable relative to said first part, a light source, an elongated flexible glass fiber bundle having a first end and a second end with the first end connected to said light source for transmitting light through said glass fiber bundle, a flexible tubular guide enclosing at least a part of said glass glass fiber bundle between the ends thereof, a light outlet member connected to the second end of said glass fiber bundle for directing the light therefrom, wherein the improvement comprises that said light source is mounted on said treatment chair, said flexible tubular member extending from the second end of said glass fiber bundle, a holder mounted on said tubular guide extending from the second end of said glass fiber bundle and disposed in spaced relation to said light outlet member, said holder being fixed to the second part of said treatment chair so that the part of said tubular guide and said glass fiber bundle therein extending between said holder and said light outlet member is maintained in position relative to said second part even though said second part moves relative to said first part of said treatment chair.

4,233,650

BRIGHTNESS CONTROL FOR FIBER OPTICAL LAMPS

Willi Hagner, Solms, and Horst Frimmel, Hermannstein, both of Fed. Rep. of Germany, assignors to Ernst Leitz Wetzlar GmbH, Fed. Rep. of Germany

Filed Sep. 29, 1978, Ser. No. 947,093

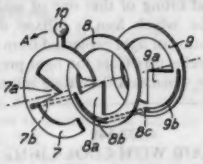
Claims priority, application Fed. Rep. of Germany, Oct. 8, 1977, 2745397

Int. Cl.³ F21V *7/04*; G02B *9/00*; F21V *17/02*

U.S. Cl. 362—32 **5 Claims**

1. A brightness control device for use with fiber optical lamps which include an optical fiber bundle having a light entrance area and a light source which directs a light beam towards said light entrance area, comprising a diaphragm

arranged unilaterally in the light beam between said light source and said light entrance area, said diaphragm having a



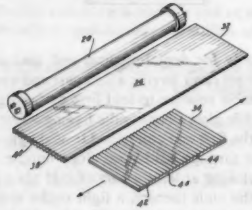
variable size and a shape such that the cross-section of the light entrance area of said fiber bundle is asymmetrically and unilaterally reduced.

4,233,651

WORK AREA LIGHTING SYSTEM

William C. Fabbri, Billerica, Mass., assignor to Keene Corporation, New York, N.Y.

Filed Mar. 30, 1978, Ser. No. 891,697
Int. Cl.³ F21V *5/02, 11/18, 13/04*
U.S. Cl. 362—33 **5 Claims**



1. A work area lighting system for providing a combination of substantially glare-free and non-glare-free light comprising: a housing positioned above said work area, said housing having an open bottom end; an elongated linear light source having a longitudinal axis mounted within said housing; a refractor comprising a pair of superimposed plate members mounted to said housing closing said open bottom end, said refractor having a first refractor plate member substantially co-extensive in length with said light source and a second refractor member shorter in length than said first member along said longitudinal axis whereby substantially all the luminous flux eminating from said light source directed toward said refractors passes through said first refractor plate member but only a portion of the luminous flux passing through said first refractor plate passes through said second refractor plate; and means for selectively positioning said second refractor plate along the light source longitudinal axis; said first refractor member having light incident and emergent surfaces and said light emergent surface having a plurality of spaced prisms extending parallel to the length of said linear light source; and, said second refractor member having light incident and emergent surfaces and said light incident surface having a plurality of spaced prisms extending perpendicular to said linear light source whereby the luminous flux passing through both said refractors is substantially glare-free and the luminous flux passing through only said first refractor is non-glare-free.

4,233,652

AIRCRAFT ILLUMINATION APPARATUS AND OPERATING CIRCUITRY

George J. Oswald, Boise, Id., assignor to Morrison-Knudsen Company, Inc., Boise, Id.

Filed Aug. 2, 1977, Ser. No. 821,131
Int. Cl.³ B64D *47/02*
U.S. Cl. 362—63 **8 Claims**

1. Aircraft landing, take-off, and taxiing illumination apparatus for use in combination with an aircraft having a fuselage, a retractable front landing gear, on openable and retractable front landing gear door located in a forward bottom portion of the fuselage, and an electric power source, comprising,

illumination means including at least one electric light source,

mounting means for mounting such illumination means on an interior portion of such landing gear door, and

electrical circuit apparatus for automatically controlling delivery of load current from such power source to the illumination means when the landing gear door is in the open position and for interrupting load current in such illumination means when the landing gear door is in the closed position,

such circuit apparatus including

power circuit means for carrying such load current,

a control circuit for carrying a control signal without carrying load current, and

switch means for changing state responsive to the opening and retracting of such landing gear door,

the power circuit interconnecting the electrical power source and the illumination means and including means for interrupting load current in the power circuit,

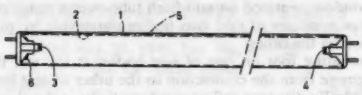
the control circuit intercoupling the switch means and the power circuit and including control means for controlling the means for interrupting load current in the power circuit responsive to the state of the switch means.

4,233,653

LOW-PRESSURE MERCURY VAPOR DISCHARGE LAMP

Hermanus M. Jongerius, and Rein W. van der Wolf, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 16, 1977, Ser. No. 852,070
Claims priority, application Netherlands, Nov. 19, 1976, 7612881
Int. Cl.³ F21V *9/16*
U.S. Cl. 362—84 **1 Claim**



1. A low-pressure mercury vapor discharge lamp for cooperation with an associated electrical power supply which comprises: a tubular glass envelope having first and second ends,

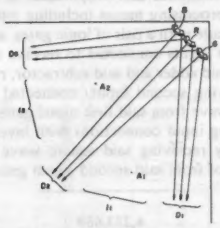
first and second electrodes sealed respectively at said first and second ends of said envelope with connection means extending out of said envelope, an ionizable medium disposed in said tube which includes mercury, a light-transmissive conductive layer disposed on the inside of said glass envelope which is not connected to either electrode, said layer extending over substantially the full axial extent of said envelope and extending over less than the entire extent of the envelope at each axial cross-section, a luminescent coating disposed on said layer, and an amalgam disposed in said tube.

4,233,654

METHOD OF LIGHTING FOR COLORED SHADOWS

Michihiro Tsuchihashi; Masato Saito; Makoto Yamanoshita, all of Amagasaki; Hidetoshi Katsura, Kamakura; Osamu Myodo, Kamakura, and Koichiro Maeyama, Kamakura, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 795,445, May 10, 1977, abandoned. This application Jan. 24, 1979, Ser. No. 6,177
Claims priority, application Japan, May 25, 1976, 51-60315
Int. Cl.[2] F21V *9/00*
U.S. Cl. 362—231 **4 Claims**



1. A method of obtaining sharply defined and illuminated color shadows, comprising the steps of:

arranging first, second and third light sources in spaced apart relationship;

providing a plurality of closely adjacent color lights in each of said first, second and third light sources, with the color lights in the first light source producing light for yellow to red colors, the color lights in the second light source producing light for green color, and the color lights in the third light source producing light for violet to blue colors; and

orienting the plurality of lights in the first, second and third light sources so that one light from each light source is aimed in a first direction to thereby obtain illumination of an area with light from each of the three light sources, and aiming at least another light from each of the light sources in at least another direction to thereby obtain illuminatin of another area with light from each of the three sources, each such area therefore being illuminated as if by light from a common source and the phenomenon of shadow doubling thus being avoided.

4,233,655

SPOTLIGHT

Francis J. Zelina, Jr., Erie, and John H. Zelina, Jr., Fairview, both of Pa., assignors to Lighting Systems, Inc., Erie, Pa.

Filed Oct. 16, 1978, Ser. No. 947,779
Int. Cl.[3] F21V *17/00*
U.S. Cl. 362—258 **20 Claims**

1. A spotlight (10) comprising,

a housing (11),

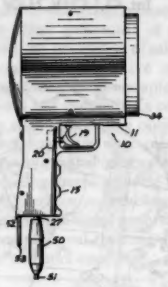
said housing being made of two halves (13,14),

said two halves enclosing a hollow space having an open front end,

a lamp (12) in said hollow space in said housing (11),

a handle (15) having two halves each said half being integrally fixed to said halves of said housing (11),

each of said halves (13,14) having radially inwardly directed circumferentially spaced first leaves (25) adjacent said open end and inwardly directed circumferentially spaced second leaves (24) adjacent said open end and spaced from said first leaves integrally fixed thereto,



said lamp having a generally round shaped rim adjacent said open front end,

said rim being received between the said first leaves and said second leaves (24),

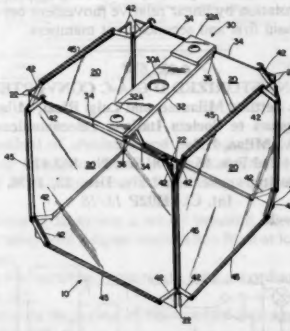
said second leaves providing a shock absorbing means for supporting said lamp whereby damage to said lamp from impact of said housing is minimized.

4,233,656

ASSEMBLABLE LAMP SHADE AND STRUCTURES

Norman S. Shemitz, Milford, Conn., assignor to Shemsafe Incorporated, Milford, Conn.

Filed Oct. 12, 1978, Ser. No. 950,592
Int. Cl.[3] F21V *1/06, 1/12*
U.S. Cl. 362—352 **19 Claims**



1. An improved support system for a lamp shade of the type having a plurality of panels connected together by the support system in a predetermined polyhedral configuration, each of the panels defining a plurality of corners; comprising, a plurality of collars, each collar being adapted to extend around a corresponding one of the panel corners, elastic connecting members connecting at least some of the collars together such that groups of opposing, adjacent collars on juxtaposed panels are connected together at their proximate ends by a said elastic member, and at least some of the said groups of collars are connected to other groups of collars which are spaced from the first group, by tensioned elastic members stretched between the said groups of collars, such that all of the collars are capable of being releaseably held in place on their respective panels, to releaseably hold all of the panels under the tension of

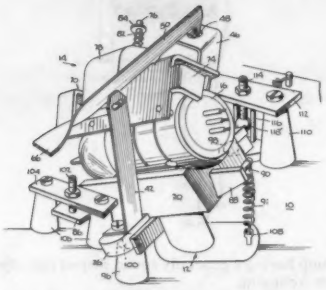
the elastic members in the predetermined polyhedral configuration.

4,233,657

SOURCE LAMP POSITIONING APPARATUS

Charles F. deMey, II, West Redding, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Feb. 2, 1979, Ser. No. 8,916
Int. Cl.³ F21V *23/04*
U.S. Cl. 362—396 **14 Claims**



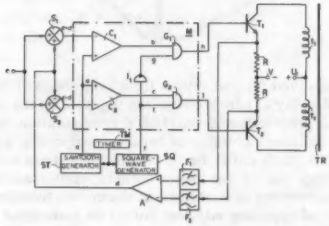
1. In an optical apparatus including a base member, a substantially cylindrical radiation source lamp having a sidewardly projecting cylindrical protrusion, and a holder for adjustably positioning said lamp to direct radiation along a preselected optical axis, the improvement which comprises: first and second pivot members intermediate said base member and holder on an axis of rotation substantially perpendicular to said optical axis; means intermediate said base member and holder defining a linear groove parallel to said axis of rotation and receiving said first and second pivot members therein; means for resiliently urging said holder in a first direction of rotation about said axis of rotation; means for adjustably restraining said holder from rotation in said first direction of rotation; and means for adjustably translating said holder along said axis of rotation by linear relative movement between said groove and said first and second pivot members.

4,233,658

TRANSISTORIZED D-C/A-C CONVERTER

Elio Lupatin, Settimo Milanese, and Luigi Rizzi, Milan, both of Italy, assignors to Societa Italiana Telecomunicazioni Siemens S.p.A., Milan, Italy

Filed Feb. 16, 1978, Ser. No. 863,412
Claims priority, application Italy, Dec. 23, 1976, 30814/76
Int. Cl.³ H02P *13/18*
U.S. Cl. 363—26 **7 Claims**



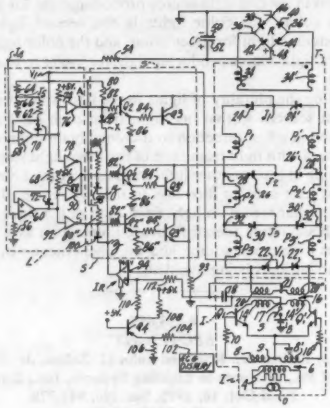
1. A d-c/a-c converter comprising:
a transformer having a secondary winding connected across a load and a primary winding divided into two symmetrical halves;
a pair of transistors each having a base, a collector and an emitter, the collector/emitter path of each transistor being connected between a respective half of said primary winding and a common junction point;
a supply of direct current connected between said junction point and a center tap of said primary winding, thereby forming a pair of substantially identical circuit branches for the energization of said halves upon conduction of the respective transistors;
sensing means connected across symmetrical portions of said circuit branches for producing an unbalance signal in response to an unsymmetrical current component traversing said primary winding;
an adder and a substractor connected in parallel to said sensing means and to a source of reference voltage for producing two control signals varying in opposite senses upon deviations of said unbalance signal from zero;
a first signal generator producing a sawtooth voltage;
a second signal generator producing a square wave with a period twice that of said sawtooth voltage; and
processing means delivering a pair of pulse trains, of a pulse width varying with the sign and the magnitude of said unbalance signal, to the bases of said transistors for alternately saturating said transistors with a relative timing tending to minimize said unsymmetrical current component, said processing means including a pair of comparators in cascade with a pair of logic gates, said comparators having first inputs connected to receive said control signals from said adder and said subtractor, respectively, and further having second inputs connected to receive said sawtooth wave from said first signal generator, said logic gates having input connections with inversion means for respectively receiving said square wave and a complement thereof from said second signal generator.

4,233,659

DEFIBRILLATOR CHARGING CURRENT REGULATOR

Sherman J. Pirkle, Waltham, Mass., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jan. 5, 1978, Ser. No. 867,264
Int. Cl.³ H02P *13/00*
U.S. Cl. 363—134 **3 Claims**



1. The combination of
a battery,
an inverter having an input and an output, said input being coupled to said battery,
a transformer having primary and secondary windings, said primary winding being coupled to said output of said inverter,

a rectifier having an input and an output, said input being coupled to said secondary winding of said transformer,

a capacitor to be charged coupled to the output of said rectifier,

a plurality of variable impedance devices,

switching means coupled to said capacitor for connecting different points on said primary winding through a respective one of said variable impedance devices so as to provide a current return path to said inverter as the voltage across said capacitor increases through pedetermined values,

a resistor connected in series with said variable impedance devices, and

means for varying the impedance of the variable impedance device that is in the current return path in accordance with a comparison between the voltage across said resistor and the voltage of said battery.

4,233,660

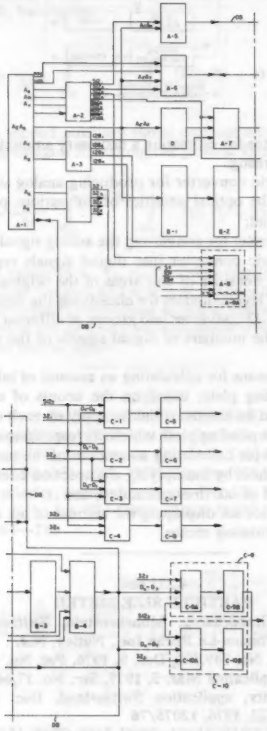
VENDING MACHINE CONTROL SYSTEM

John C. Fagan, Oak Lawn, Ill., assignor to Artag Plastics Corporation, Rosemont, Ill.

Filed Oct. 12, 1978, Ser. No. 950,683

Int. Cl.³ G06F *15/46; G07F 5/22, 11/00*

U.S. Cl. 364—104 **5 Claims**



1. A system for controlling the operation sequencing of a machine comprising, actuating signal generating means for generating actuating signals coupled to dispensing actuators for effecting operation of a machine including said actuators operable upon the receipt of an actuating signal to effect the operation thereof, programmable command signal generating means coupled to said actuating signal generating means for coupling command signals thereto for effecting generation of said actuating signals therefrom, condition responsive means coupled to said actuating signal generating means for generating a condition responsive signal thereto, said actuating signal generating means actuable upon receipt of said condition responsive signal and a command signal generated by said programmable command signal generating means to produce said actuating signals responsive to the condition responsive signal for effecting operation of the actuators of said machine, wherein said actuating signal generating means produces an enabling signal coupled to said programmable command signal generating means to effect generation of a command signal therefrom for effecting the generation of said actuating signals, and wherein said condition responsive means comprises a verification signal generating means coupled to said actuating signal generating means and generating a condition responsive verification signal to verify dispensing operation of a machine actuator which has been operated upon receipt of an actuating signal from said actuating signal generating means, and said actuating signal generating means actuable upon receipt of said verification signal to produce an enabling signal coupled to said programmable command signal generating means to effect generation of a command signal resetting said actuating signal generating means to an initial condition.

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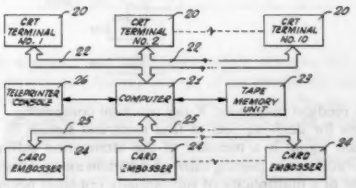
COMPUTER CONTROLLED REGISTRATION AND INQUIRY SYSTEM

Edgar A. Bolton, 22051 Capistrano La., Huntington Beach, Calif. 92646, and Larry D. Dallen, 4806 Darien St., Torrance, Calif. 90503

Continuation of Ser. No. 443,422, Feb. 19, 1974, abandoned, which is a continuation of Ser. No. 278,540, Aug. 8, 1972, abandoned. This application Jul. 31, 1978, Ser. No. 929,100

Int. Cl.³ G06F *9/00;* **B41J** *1/54*

U.S. Cl. 364—300 **3 Claims**



1. A method of obtaining and processing information on a multiplicity of registrants to be registered and generating an embossed identification card therefrom comprising the steps of:

intermittently receiving a set of inputted registration data associated with a signal registration from at least one input means;

editing the inputted registration data according to the substeps of:

comparing the format of the inputted data against a predefined format,

observing the stored registration data and replacing the stored registration data which is incorrect with new registration data for obtaining a set of correct registration data;

generating a flag signal when a complete set of correct registration data is stored in the editing means;

utilizing a controller means for:

storing a plurality of sets of correct registrtion data in a first data storage means;

intermittently selecting a set of correct registration data and enabling the transfer of that selected set of correct registration data between the controller means and the editing means;

intermittently selecting one of a plurality of embossing means and enabling the transfer of a first selected por-

tion of a selected set of the correct registration data to the selected embossing means;

intermittently enabling the transfer of the second selected portion of a selected set of correct registration data to a second storage means, all of said transfers occurring according to a programmed priority schedule.

4,233,662

RADIOGRAPHY

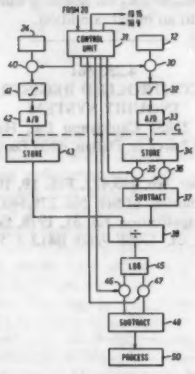
Christopher A. G. LeMay, Osterley, England, assignor to EMI Limited, Hayes, England

Continuation of Ser. No. 781,961, Mar. 28, 1977, Pat. No. 4,114,042, which is a continuation of Ser. No. 609,718, Sep. 2, 1975, Pat. No. 4,038,551, which is a division of Ser. No. 462,104, Apr. 18, 1974, Pat. No. 3,924,129. This application Feb. 13, 1978, Ser. No. 877,228

Claims priority, application United Kingdom, Apr. 25, 1973, 19528/73; Aug. 21, 1973, 39420/73; Oct. 11, 1973, 47507/73

Int. Cl.³ G01N *21/34*

U.S. Cl. 364—414 **4 Claims**



1. A medical diagnostic X-ray machine comprising:

means for deriving sets of first electrical signals in which each signal is a measure of the attenuation suffered by X-radiation in passing through a patient along a respective one of a multiplicity of substantially coplanar beam paths and the signals of each set are measures of the attenuation along a respective set of said beam paths, each set of beam paths being oriented relative to the patient at a respective angle or mean angle different from that of any other set of beam paths;

means for converting each set of first electrical signals into a respective set of second electrical signals by providing a sequence of weighting factors comprising a central weighting factor and a plurality of other weighting factors symmetrically disposed to either side of said central factor, said other factors being of opposite polarity to said central factor, and accumulating, for each first electrical signal, the products of the last recited first electrical signal times the central weighting factor of the sequence, and the product of each of the other first electrical signals of the same set times respective of said further weighting factors, the weighting factors at least after the first five changing monotonically in amplitude; and

means for providing a matrix of storage locations corresponding to a matrix of elements into which a slice of the patient coinciding with the plane of the beam paths is notionally divided by a rectangular grid and for accumulating in each storage location contributions from those second electrical signals which correspond in position in their respective sets to first electrical signals which are measures of the X-ray attenuation along beam paths passing through the slice element corresponding to the last recited storage location, said last recited contributions being weighted in accordance with the relative dispositions of the last recited storage location and beam paths.

4,233,663

APPARATUS FOR ESTIMATING A NECESSARY AMOUNT OF INK

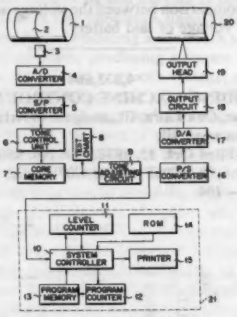
Kazuo Sugawara; Sei Sanada, both of Tokyo, and Yosiharu Kobayashi, Yokohama, all of Japan, assignors to Toppan Printing Co., Ltd., Tokyo, Japan

Filed Dec. 12, 1978, Ser. No. 968,700

Claims priority, application Japan, Dec. 15, 1977, 52-151033

Int. Cl.³ H04N *1/22*; B41M *1/10*

U.S. Cl. 364—515 **5 Claims**



1. An apparatus for estimating a necessary amount of ink for printing, comprising:

a photoelectric converter for producing analog signals representing the optical densities of the various parts of an original print;

an A-D converter for converting the analog signals from the photoelectric converter into digital signals representing the optical densities of unit areas of the original print;

a plurality of level counters for classifying the digital signals from the A-D converter into groups of different levels and counting the numbers of digital signals of the respective groups;

calculating means for calculating an amount of ink to apply on a printing plate, based on the counts of each level counter and an amount of ink to apply on each of the unit areas of the printing plate which correspond to the digital signals and for calculating an amount of ink necessary to print one sheet by multiplying a correction coefficient by the amount of ink thus calculated; and

a display device for displaying the amount of ink calculated by the calculating means.

4,233,664

PARTICLE SIZE METER

Pierre-André Grandchamp, Münchenstein, Switzerland, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 749,202, Dec. 9, 1976, Pat. No. 4,158,234. This application Mar. 5, 1979, Ser. No. 17,642

Claims priority, application Switzerland, Dec. 12, 1975, 16146/75; Sep. 23, 1976, 12075/76

Int. Cl.³ G01N *15/02*; G06G *7/48*; G06F *15/20*

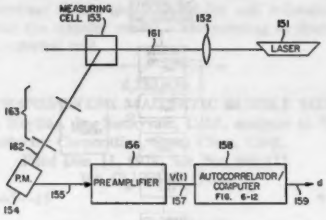
U.S. Cl. 364—555 **4 Claims**

1. In an apparatus for measuring the size of particles in Brownian motion in suspension in a solvent, the combination comprising:

(a) means for producing a beam of coherent light waves;

(b) a sample cell for containing a quantity of the solvent, said sample cell being interposed along the path of propagation of said beam, so that a portion thereof is scattered by said particles;

(c) energy detector means for detecting energy waves scattered by the particles at a given angle with respect to the beam of coherent light waves, said energy detector means providing a first output signal v(t) corresponding to the variation with time of the intensity of the scattered waves at the given angle; and



(d) electronic circuit means for processing said first output signal v(t) to derive asecond output signal representative of the size of the particles, said electronic circuit means including:

means for processing the first output signal to derive:

a first auxiliary signal corresponding to a first double integral R_1 having the

$$R_1 = \frac{1}{\Delta t} \int_{t_o}^{t_o + \Delta t} \int_{\tau_a}^{\tau_b} V(t)\, V(t+\tau)\, dt\, d\tau$$

and a second auxiliary signal corresponding to a second double integral R_2 having the general form

$$R_2 = \frac{1}{\Delta t} \int_{t_o}^{t_o + \Delta t} \int_{\tau_c}^{\tau_d} V(t)\, V(t+\tau)\, dt\, d\tau$$

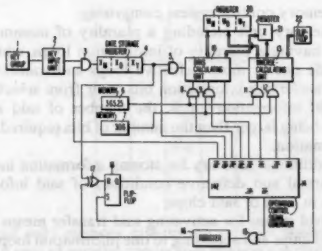
where the values of τ_a, τ_b, τ_c, τ_d, define integration ranges in the delay-time τ region and where Δt represents an integration range with respect to time from an initial instant t_0, and means for combining the first and second auxiliary signals to derive said second output signal.

4,233,665

DATE DATA PROCESSOR

Yukio Maehashi, and Hidetoshi Kosaka, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Dec. 19, 1978, Ser. No. 971,129
Claims priority, application Japan, Dec. 20, 1977, 52-153934
Int. Cl.³ G06F *15/02, 15/20*
U.S. Cl. 364—715 **7 Claims**



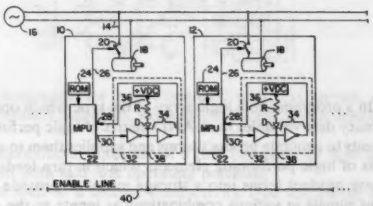
1. A date data processing system comprising first memory means for storing a date to be processed, means for calculating a difference in days from a reference date to said date, means for producing an inversely-calculated date by inversely-calculating a date from said difference in days and said reference date, second memory means for storing said inversely-calculated date, means for comparing the contents of said first memory means with the contents of said second memory means, and wherein said first memory means retains said date to be processed at least until termination of comparison by said comparing means.

4,233,666

DRIVE POWER SEQUENCING

Per-Erik Walberg, San Jose; Donald F. Johann, Palo Alto, and Charles E. Mendenhall, Campbell, all of Calif., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Oct. 19, 1978, Ser. No. 952,767
Int. Cl.² G06F *1/00*
U.S. Cl. 364—900 **16 Claims**



1. In a digital computer information storage and access system having an arbitrary number of independently operative mass storage drives, each drive characterized by an electric motor adapted to operate continuously during data storage and access and further operative to start up in response to a motor start signal, an apparatus for directing the random sequential starting up of all said motors, said apparatus comprising:

a single signal and control line coupled in common to each one of said drives and operative to convey a TRUE-FALSE signal from a central controller having no knowledge of the state of operation of said drives, said TRUE-FALSE signal indicating in a first state the disallowability of a drive to enable a motor start up sequence;

a first circuit means associated with each one of said drives and coupled to said signal and control line for sensing said TRUE-FALSE state signal and conveying said state signal to a third circuit means;

a second circuit means associated with each one of said drives and coupled at a common node with said first circuit means to said signal and control line for overriding said TRUE-FALSE signal to establish said first state on said signal and control line in response to a signal from a third circuit means; and

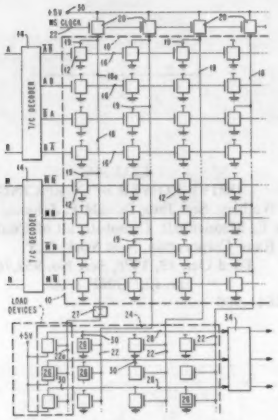
a third circuit means associated with each one of said drives and responsive to said first circuit means of said associated drive for issuing, in response only to a second state of said TRUE-FALSE state signal conveyed to it by said first circuit means, said motor start signal to said motor associated therewith and operative to issue said disallow sequence enable signal to said second circuit means and thereby to cause said second circuit means to override said signal and control line in order to prevent any other motor to start up for the duration of said override signal.

4,233,667

DEMAND POWERED PROGRAMMABLE LOGIC ARRAY

William T. Devine, Ulster Park, and William Gianopulos, West Hurley, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 23, 1978, Ser. No. 954,136
Int. Cl.³ G06F *1/00*; H03K *19/20*
U.S. Cl. 364—900 **6 Claims**



1. In a programmable logic array of the type which operates on binary data variables in an AND matrix of logic performing elements to generate product terms and supplies them to an OR matrix of logic performing elements which in turn feeds sums of these product terms into a storage means to provide those output signals in various combinations as inputs to the AND array, the improvement comprising:

logic means including at least logic performing elements in the AND matrix to generate a control signal from said binary data variables and powering means responsive to said control signal to conditionally power at least a portion of one of the logic performing parts of the programmable logic array in response to said control signal.

4,233,668

METHOD AND APPARATUS FOR TESTING A MAGNETIC BUBBLE MEMORY

Nakahiko Yamaguchi, Sayama; Susumu Hibi, Fujisawa; Shigeru Yoshizawa, Tokorozawa; Shoji Yoshimoto, and Akira Kobayashi, both of Mobara, all of Japan, assignors to Nippon Telegraph and Telephone Public Corporation and Hitachi, Ltd., both of, Japan

Filed Sep. 29, 1978, Ser. No. 946,864
Claims priority, application Japan, Sep. 30, 1977, 52-117929
Int. Cl.³ G11C *19/08*
U.S. Cl. 365—1 **9 Claims**

1. A method for testing a magnetic bubble memory comprising the steps of:

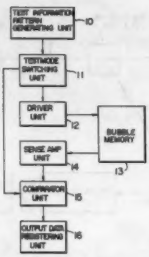
storing a basic pattern [P] represented by binary notation in a first memory unit and storing a test information pattern for determining an arrangement of said basic patterns [P] and complementary patterns $\overline{[P]}$ thereof in a second memory unit;

sequentially reading said basic pattern [P] and said complementary pattern $\overline{[P]}$ in accordance with said test information pattern;

converting said patterns into a logical signal corresponding to binary notation;

generating a magnetic bubble pattern corresponding to said test information pattern in a storage area of said magnetic bubble memory by a driver unit through a test mode switching unit;

converting a magnetic bubble domain train of said magnetic bubble pattern into a logical signal by a magnetic bubble domain detector and an output amplifier unit;



comparing said logical signal corresponding to said magnetic bubble domain train with said logical signal corresponding to said test information pattern by a comparator unit to determine identity or non-identity thereof; and

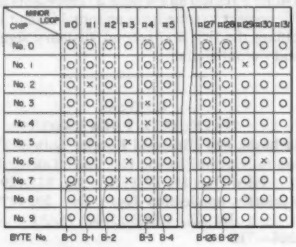
evaluating a memory characteristic of said magnetic bubble memory by the output from said comparator unit.

4,233,669

REDUNDANT BUBBLE MEMORY CONTROL SYSTEM

Kazuo Furukawa, Yokohama, and Sumio Furukawa, Tokorozawa, both of Japan, assignors to Nippon Telegraph and Telephone Public Corporation and Hitachi, Ltd., both of, Japan

Filed Apr. 19, 1978, Ser. No. 897,692
Claims priority, application Japan, Apr. 20, 1977, 52-44446; Nov. 30, 1977, 52-142759; Nov. 30, 1977, 52-142760
Int. Cl.³ G11C *19/08*
U.S. Cl. 365—15 **14 Claims**



1. A memory control system comprising:

(a) a memory unit including a plurality of memory chips each having a plurality of information loops which may include one or more defective loops and transfer means for transferring information bits to or from selected ones of said information loops, the number of said memory chips being larger than the number of bits required for unit information;

(b) an additional memory for storing information indicative of normal and defective conditions of said information loops in each of said chips;

(c) control means for activating said transfer means in each of said chips and accessing to one information loop in each of said chips at the same timing to transfer the information bits to or from the information loop group; and

(d) connection control means for reading information stored in said additional memory to determine locations of said defective information loops to identify the defective loops

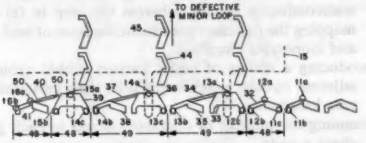
in the information loops of the respective chips accessed by said control means and selecting normal loops which are equal in number to the number of bits required for the unit information, for each information loop group accessed at each timing, when the number of the normal loops other than the defective loops included in said accessed information loop group is equal to or more than said number of bits required for the unit information, to connect the transfer means corresponding to those loops to an external unit.

4,233,670

FAULT TRANSPARENT MAGNETIC BUBBLE MEMORY

George F. Reyling, Jr., Sunnyvale, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Dec. 11, 1978, Ser. No. 968,172
Int. Cl.[3] G11C *19/08*
U.S. Cl. 365—15 9 Claims



1. A fault transparent magnetic bubble memory comprised of;

a plurality of minor loop means for propagating bubbles in parallel therein;

serial-parallel input means for propagating bubbles to said minor loops wherein the serial portion of said serial-parallel means consists of a predetermined number of pairs of single-distance propagation means between each of the parallel inputs;

parallel-serial output means for propagating bubbles from said minor loops wherein the serial portion of said parallel-serial means consists of a predetermined number of pairs of single-distance propagation means between each of the parallel outputs; and

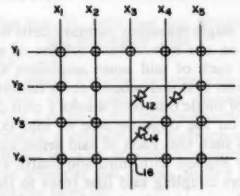
shorting means lying between each of said pairs of single-distance propagation means for converting said pairs into double-distance propagation means, said shorting means also being selectively destructable.

4,233,671

READ ONLY MEMORY AND INTEGRATED CIRCUIT AND METHOD OF PROGRAMMING BY LASER MEANS

Levy Gerzberg; Arnon Gat, both of Palo Alto; Roger Melen, Los Altos Hills, and James F. Gibbons, Palo Alto, all of Calif., assignors to Stanford University, Stanford, Calif.

Filed Jan. 5, 1979, Ser. No. 1,360
Int. Cl.[2] G11C *17/06*
U.S. Cl. 365—105 25 Claims



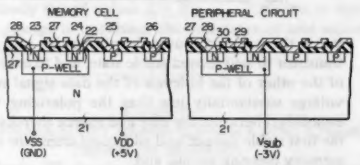
1. A read only memory comprising support means, a first plurality of spaced parallel conductive lines on a surface of said support means, said first plurality of conductive lines including dopants of a first conductivity type, a layer of polycrystalline semiconductor material overlaying said first plurality of conductor lines, said layer of polycrystalline semiconductor material including regions of doped material extending at least partially through said layer, said doped regions including dopants of opposite conductivity type, each of said regions being positioned above one line of said first plurality of conductive lines, and a second plurality of spaced parallel conductive lines on the surface of said layer of polycrystalline semiconductor material, said second plurality of conductive lines being skewed with respect to said first plurality of conductive lines with said regions of doped material provided at crossing points of said first plurality of lines and said second plurality of lines.

4,233,672

HIGH-SPEED SEMICONDUCTOR DEVICE

Yasoji Suzuki, Ayase; Kiyofumi Ochii, Inagi, and Hirozi Asahi, Zama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 20, 1978, Ser. No. 962,222
Claims priority, application Japan, Nov. 21, 1977, 52-139586
Int. Cl.[2] G11C *7/00*
U.S. Cl. 365—181 3 Claims



1. A semiconductor device operated with first, second, and third operating potentials, said semiconductor device comprising:

a semiconductor substrate of a first conductivity type supplied with said first operating potential;

a first well of a second conductivity type formed in said substrate and having a source region and a drain region, both of said first conductivity type, formed therein to form capacitive PN junctions therewith, said first well and said source region formed in said first well being supplied with said second operating potential; and

a second well of said second conductivity type formed in said substrate and having a source region and a drain region, both of said first conductivity type, formed therein of form capacitive PN junctions therewith, said source region formed in said second well being supplied with said second operating potential and said second well being supplied with said third operating potential to make the capacitances of said PN junctions formed in said second well smaller than the capacitances of said PN junctions formed in said first well.

4,233,673

ELECTRICALLY RESETTABLE NON-VOLATILE MEMORY FOR A FUSE SYSTEM

James R. Cricchi, and Gustav Cavar, both of Baltimore, Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 24, 1970, Ser. No. 49,429
Int. Cl.[3] G11C *11/40*
U.S. Cl. 365—184 10 Claims

1. An electrically resettable memory for storing a plural bit data word comprising:

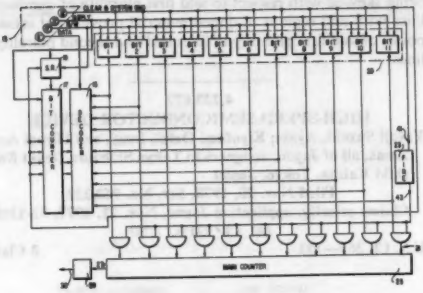
a plurality of memory storage bits, each of said storage bits comprising a variable threshold voltage transistor having a first and a second stable state,

means for applying a negative polarizing voltage to the gate of each of said storage transistors,

memory clearing means for applying a positive polarizing voltage to said storage bits to set said storage bits to a first stable threshold voltage state,

means for supplying a bi-level data signal representing a plural bit data word,

addressing means for sequentially addressing said plurality of storage bits and for coupling the bi-level data signal to the source of said addressed storage bit transistors to enable storage of one of the bi-levels of the data signal such that a negative polarizing voltage is established between the gate and source thereby setting said addressed transistor to said second stable state, and to enable storage of the other of the bi-levels of the data signal such that a voltage substantially less than the polarizing voltage is established between the gate and source thereby retaining the first stable state of said addressed transistor set by said memory clearing means, and



write means for selectively applying a negative polarizing voltage to an addressed storage bit to set said addressed storage bit to the second stable threshold voltage state in accordance with a predetermined, corresponding data bit.

4,233,674

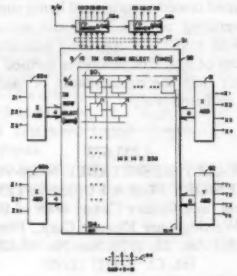
METHOD OF CONFIGURING AN INTEGRATED CIRCUIT

Lewis K. Russell, San Jose, and David Kleitman, Los Altos Hills, both of Calif., assignors to Signetics Corporation, Sunnyvale, Calif.

Division of Ser. No. 675,776, Apr. 12, 1976, which is a continuation of Ser. No. 452,195, Mar. 18, 1974, abandoned. This application Aug. 7, 1978, Ser. No. 931,591

Int. Cl.³ G11C *11/40*

U.S. Cl. 365—200 **6 Claims**



1. A method of configuring an integrated circuit, comprising:

(a) providing an array of unconnected semiconductor circuits spaced apart in a semiconductor body;

(b) providing a pattern of conductive paths extending over a substantial portion of the length and breadth of a surface of said body, interlaced between said semiconductor circuits and spaced therefrom;

(c) providing at least partly within said body adjacent to each of said semiconductor circuits and coupled between adjacent semiconductor circuits and adjacent conductive paths semiconductor switching means capable of being switched between high impedance and low impedance state;

(d) testing each one of said semiconductor circuits to determine its operability;

(e) recording the location of each of said semiconductor circuits and assigning an indicator to each location representing the operability or inoperability of each semiconductor circuit so located;

(f) coupling at least some of said operable semiconductor circuits to said conductive paths by causing said semiconductor switching means selectively to assume a low impedance state adjacent to locations where the recording indicates an operable semiconductor circuit, and

(g) decoupling said inoperable semiconductor circuits from said conductive paths by causing said semiconductor switching means to assume a high impedance state at locations where the recording indicates an inoperable semiconductor circuit, wherein the step in (e) includes mapping the cartesian coordinate location of said operable and inoperable circuits,

producing a matrix of nodes located within groupings of adjacent circuits as represented by their cartesian coordinate location,

summing the number of operable circuits in each grouping about a node,

selecting those nodes which have the greater number of operable circuits adjacent thereto, and

utilizing the results of said node selection to perform the step in (f).

4,233,675

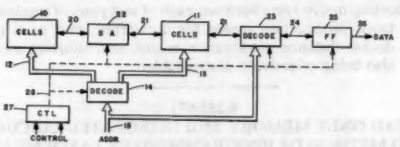
X SENSE AMP MEMORY

Joel A. Karp, Palo Alto; Ilbok Lee, Sunnyvale, and John A. Reed, Los Altos, all of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Continuation of Ser. No. 919,993, Jun. 28, 1978, abandoned. This application Jun. 8, 1979, Ser. No. 46,509

Int. Cl.³ G11C *7/00, 7/06*

U.S. Cl. 365—205 **7 Claims**



1. A semiconductor memory comprised of:

a semiconductor substrate;

a column of N sense amplifiers disposed on said substrate where N is any integer; each of said sense amplifiers consisting of only one pair of transistors that are cross-coupled to form a set node, a reset node, and a sense enable node;

2N rows of single transistor memory cells disposed on said substrate on one side of said column of sense amplifiers such that each of said sense amplifiers are respectively aligned with first and second rows thereof, plus another 2N rows of single transistor memory cells disposed on said substrate on the opposite side of said column of sense amplifiers such that each of said sense amplifiers are respectively aligned with third and fourth rows thereof;

2N transistors coupling said first rows to the set node and said third rows to the reset node of the respectively aligned amplifiers in response to one control signal, plus another 2N transistors coupling said second row to the reset node and said fourth row to the set node of the respectively aligned amplifiers in response to another control signal; and

a decoder disposed on said substrate at one end of said another 2N rows of memory cells for selectively reading

data from anyone of said N sense amplifiers and for selectively setting and resetting the sense amplifier to write data into the memory cells connected thereto.

4,233,676

MIXING MECHANISM FOR A MIXING MACHINE

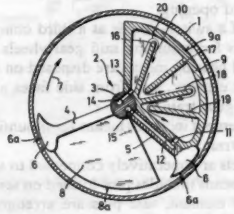
Roland Lücke, and Eberhard Lipp, both of Paderborn, Fed. Rep. of Germany, assignors to Gebruder Lodige Maschinenbau GmbH, Paderborn, Fed. Rep. of Germany

Filed Jan. 23, 1979, Ser. No. 5,863

Claims priority, application Fed. Rep. of Germany, Feb. 24, 1978, 2802876

Int. Cl.³ B01F *15/06*

U.S. Cl. 366—147 **7 Claims**



1. A mixing mechanism for a mixing machine, comprising a shaft rotatably mounted in an at least partly cylindrical container of the said machine, arms extending radially outwardly from an inner end thereof connected to the shaft to an outer end thereof, mixing tools mounted on the said outer ends of the arms, and plate-like extensions mounted on the rear sides, as viewed in the rotational direction of the mixing mechanism, of at least some of the arms, said mixing tools and extensions being disposed in a helical arrangement relative to said shaft wherein the mixing tools and extensions of adjacent arms are axially spaced and angularly offset from one another, said mixing tools being constructed and arranged upon rotation of said shaft to stepwise axially convey a material being mixed between adjacent extensions with the material being impinged upon the extensions, and at least one of said extensions having a cavity therein which communicates with a circulation system leading through the shaft for circulating a heating or cooling medium, said cavity having an inlet and an outlet which lead into the respective arm or shaft.

4,233,677

AUTOMATIC SYSTEM AND METHOD FOR TESTING MARINE STREAMERS OF SEISMIC EXPLORATION SYSTEMS

Earl J. Brown, Corona, and Swan A. Sie, Placentia, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Feb. 21, 1978, Ser. No. 879,540

Int. Cl.³ G01V *1/38*

U.S. Cl. 367—13 **22 Claims**

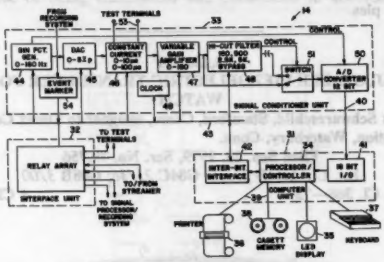
1. A method of testing a marine streamer of a seismic marine exploration system in a passive or a dynamic state, said streamer including a series of hydrophone sections $X_1, X_2, \ldots X_n$, each containing a plurality of hydrophones and being transformer-coupled via a set of marine conductors $N_1, N_2, \ldots N_n$ to a marine streamer test system aboard an exploration boat, comprising the steps of:

(a) driving one of said sections $X_1, X_2, \ldots X_n$ with an analog signal A of known characteristics applied directly to terminals of said one section;

(b) detecting an analog signal B across one of said set of conductors $N_1, N_2, \ldots N_n$ in response to said drive signal A;

(c) converting said signal B to digital values;

(d) automatically performing at least one of a series of test measurements $Z_1, Z_2, \ldots Z_m$ using a programmed digital computer of said marine system aboard said boat to determine field-worthiness of said one section $X_1, X_2, \ldots X_n$;



(e) by means of said digital computer automatically comparing one or more of test measurements $Z_1, Z_2, \ldots Z_m$ with previously stored values $Z'_1, Z'_2, \ldots Z'_m$ so as to determine change in operating characteristics of said sections $X_1, X_2, \ldots X_n$.

4,233,678

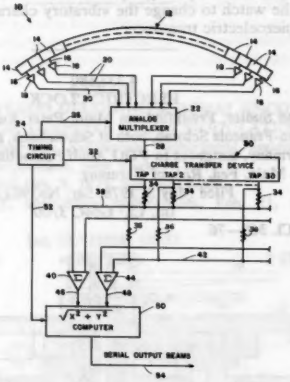
SERIAL PHASE SHIFT BEAMFORMER USING CHARGE TRANSFER DEVICES

Jesse J. Brady, III, Austin, Tex., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 12, 1979, Ser. No. 19,806

Int. Cl.³ G01S *3/80*

U.S. Cl. 367—122 **9 Claims**



1. A sonar beamformer for use with an array comprising a multiplicity of transducer elements for providing electrical analog signals corresponding to acoustic energy impinging thereon, said beamformer comprising:

timing means for generating trains of time related clock signals;

analog multiplexer means, responsive to first clock signals, for scanning said array elements in predetermined order and generating a serialized output of the analog signals thereof;

plural stage means, responsive to second clock signals, for taking analog samples of said multiplexer means output and shifting of said samples to successive stages for parallel read-out of said analog samples;

weighting means, connected to each of said stages, for providing scaled analog samples in accordance with the rela-

tive position of the corresponding elements in the array; and

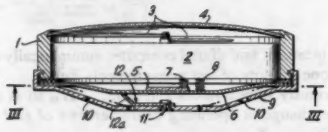
summing means, responsive to said weighted analog samples, for providing summations of said scaled analog samples.

4,233,679

ADJUSTABLE PIEZOELECTRIC TRANSDUCER FOR A WATCH

Jack Schwarzschild, Stamford, Conn., assignor to Timex Corporation, Waterbury, Conn.

Filed Sep. 28, 1979, Ser. No. 79,756
Int. Cl.³ G04B *21/10*; G04C *21/38*; G08B *3/00*
U.S. Cl. 368—72 **4 Claims**



1. In a watch having a case containing a movement, a power source, and electric circuitry, a piezoelectric transducer comprising a flexible disc-shaped membrane and a piezoelectric wafer attached thereto, and a caseback enclosing the watch movement within the case, the improvement comprising:

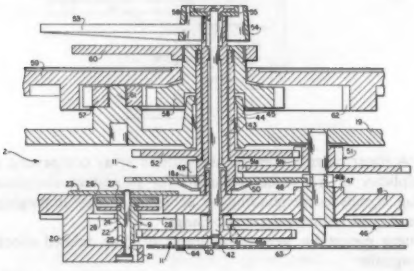
frequency adjustment means disposed within said caseback and accessible from the exterior of the watch case, said frequency adjustment means including a movable element disposed within the watch case and having a portion contacting said membrane, said element being movable so as to contact said membrane at varying radial locations when said frequency adjustment means is actuated outside the watch to change the vibratory characteristics of said piezoelectric transducer.

4,233,680

ELECTRIC CLOCK

Roland Sudler, Frankfurt am Main; Peter Kupferschmidt, and Jean-Francois Schwab, both of Schwalbach, all of Fed. Rep. of Germany, assignors to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed May 3, 1978, Ser. No. 902,435
Int. Cl.³ G04C *3/00*
U.S. Cl. 368—76 **6 Claims**



1. In an electrical clock with a quartz oscillator, a frequency divider connected to and following the oscillator and an output stage driven by the frequency divider, in the output of the output stage there being disposed a single phase stepping motor acting on a clockwork gear train driving an hour tube and a coaxially mounted minute tube, and a storage battery supplying the operating voltage and a charging circuit for the battery, the improvement wherein

the single phase stepping motor, including an excitation coil, the clockwork gear train and a carrier element form a self-contained construction assembly, as a connectable first component,

a single printed circuit board, the quartz oscillator, the frequency divider, the output stage and the charging circuit being disposed on said single printed circuit board and constitute an electrical assembly, as a connectable second component,

two conducting pins being fastened to said excitation coil and operatively connecting said first component with said second component electrically,

a carrier plate being formed with an opening, said first component and said second component being secured mechanically on said carrier plate,

said hour tube and said minute tube, respectively, extending through said opening,

gearwheels of a switch device as a third component,

bearing means for mounting said gearwheels of the switch device, said bearing means are disposed on a front side of said carrier element, said front side faces away from the clockwork gear train,

said carrier element includes means for mounting said clockwork gear train,

said gearwheels are operatively connected to said hour tube,

said bearing means includes pins formed on said front side of said carrier element, said pins are arranged on a circle concentric to the hour tube,

said gearwheels of the switch device include,

a gear concentrically secured to the hour tube,

an adjustment disc of the switch device having an inner toothing concentric to the hour tube,

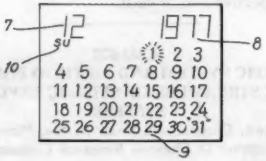
a plurality of pinions rotatably disposed on said pins and intermeshing simultaneously with said gear and said inner toothing.

4,233,681

ELECTRONIC TIMEPIECE

Masami Murata, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Dec. 29, 1978, Ser. No. 974,467
Claims priority, application Japan, Dec. 29, 1977, 52-159316
Int. Cl.³ G04B *19/06, 19/24*
U.S. Cl. 368—242 **13 Claims**



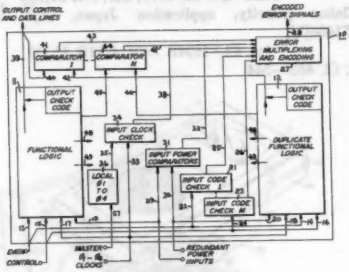
1. Display panel means for an electronic timepiece for displaying information in the form of a plurality of visible indicia, comprising means for flickering at least a selected two of said plurality of indicia, said flickering causing said selected indicia to be alternately visible and invisible, said flickering means being adapted to selectively cause each of at least two of said selected indicia to flicker at a repetition rate different from the repetition rate of the flicker of the other of said at least two of said selected indicia, said flickerings at different repetition rates occurring concurrently on said display panel means for display, said means for flickering including mode signal generating circuits outputting mode signals of different frequencies for flickering each said selected indicia at at least two repetition rates, and further including priority circuits for giving preference to one frequency of said flickering mode signals when more than one flickering mode signal is coincidentally outputted to one of said indicia.

4,233,682

FAULT DETECTION AND ISOLATION SYSTEM

Harris L. Liebergot, Lafayette Hill, and Richard M. Sedmak, Schwenksville, both of Pa., assignors to Sperry Corporation, New York, N.Y.

Filed Jun. 15, 1978, Ser. No. 915,838
Int. Cl.[3] G06F *11/16*
U.S. Cl. 371—68 14 Claims



1. An integrated circuit chip comprising in combination,

(a) a first data processing chain having an input circuit and a first plurality of output circuits spaced at different points along said first data processing chain, at least one of said first plurality of output circuits being an intermediate output circuit,

(b) a second data processing chain having an input circuit and a second plurality of output circuits spaced at different points along said second data processing chain, at least one of said second plurality of output circuits being an intermediate output circuit,

(c) input signal connections for coupling external signals to said chip,

(d) means connecting at least some of said input signal connections to said input circuits of both of said first and second data processing chains,

(e) at least one comparator circuit having a first input circuit permanently coupled to said at least one intermediate output circuit of said first processing chain for receiving signals therefrom, a second input circuit permanently coupled to said at least one intermediate output circuit of said second processing chain for receiving signals therefrom, and an output circuit,

said at least one intermediate output circuit points of said data processing chains being the equivalent to each other along the processing path in each chain, and said comparator producing at its output circuit a first signal indicating the occurrence of an error when the input signals to the said comparator represent different data and producing at its output circuit a second signal when the input signals to the said comparator represent the same data.

4,233,683

CASCADED EQUALIZER TECHNIQUE

Daniel D. McRae, West Melbourne, Fla., assignor to Harris Corporation, Cleveland, Ohio

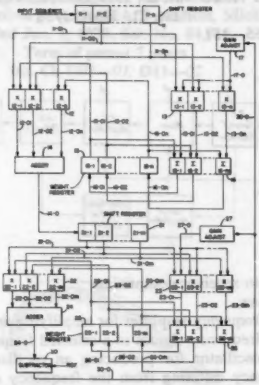
Filed Jan. 31, 1978, Ser. No. 873,912
Int. Cl.[3] H03H *7/30*
U.S. Cl. 375—14 13 Claims

1. A method for equalizing a sequence of electrical signals subjected to distortion during transmission, comprising the steps of:

providing first and second multistage equalizers having a first prescribed number of stages and a second prescribed number of stages, respectively;

applying said electrical signals to said first multistage equalizer so as to store therein a series of electrical signals of said sequence and producing therefrom a first equalized output representative of a transmitted signal estimate;

storing, in said second multistage equalizer, a series of values corresponding to actual values of electrical signals capable of being transmitted and established in accordance



with a series of first equalized outputs of said first equalizer, and producing therefrom a second equalized output;

comparing said second equalized output with a reference value and generating therefrom an error signal; and

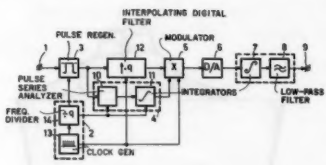
adjusting weighting coefficients of said first and second equalizers in accordance with said error signal.

4,233,684

ARRANGEMENT FOR DECODING A SIGNAL ENCODED BY MEANS OF ADAPTIVE DELTA MODULATION

Ludwid D. J. Eggermont, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 5, 1979, Ser. No. 9,208
Claims priority, application Netherlands, Feb. 21, 1978, 7801909
Int. Cl.[3] H03K *13/22*
U.S. Cl. 375—30 2 Claims



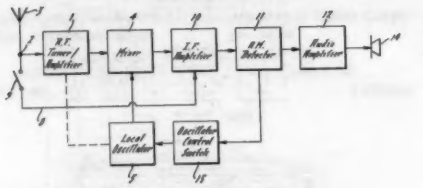
1. An arrangement for decoding a digital signal formed by an analogue data signal encoded by adaptive delta modulation, the arrangement comprising a dynamic expansion circuit having a dynamic control signal generator and a pulse modulator for modulating by the dynamic control signal the digital signal to be decoded, the modulated signal being applied to a converter for reproduction of the analogue data signal, wherein the arrangement further comprises an interpolating digital filter, having a signal-independent pulse response, for interpolating, prior to modulation by the dynamic control signal, the digital signal to be decoded.

4,233,685

RADIO FOR RECEIVING AND REPRODUCING INFORMATION BROADCAST ON THE INTERMEDIATE FREQUENCY

Stephen C. Taylor, Hadleigh, England, assignor to Ford Motor Company, Dearborn, Mich.

Filed Nov. 23, 1979, Ser. No. 97,077
Int. Cl.[3] H04B 1/26
U.S. Cl. 455—151 3 Claims



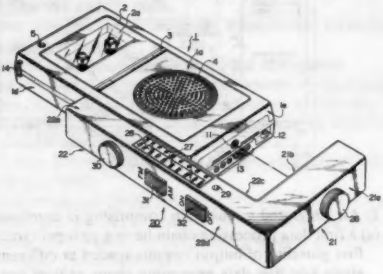
1. A radio receiver comprising:
an antenna;
a radio frequency amplifier for amplifying antenna received radio frequency signals of a selected frequency;
a local oscillator for producing an oscillator signal of a frequency differing from the frequency of the selected radio frequency signals by a predetermined amount;
a mixer for mixing the oscillator signal with the radio frequency signal to produce a radio frequency amplifier derived intermediate frequency signal;
an intermediate frequency amplifier for amplifying the signal from the mixer;
a detector producing audio frequency signals from the amplified signal from the mixer;
wherein the intermediate frequency amplifier is also connected to amplify antenna received radio frequency signals at the intermediate frequency, and said receiver includes means for stopping and starting the production of radio frequency amplifier derived intermediate frequency signals to the intermediate frequency amplifier in response to predetermined signals transmitted at the intermediate frequency.

4,233,686

RADIO TUNER FOR COUPLING WITH TAPE RECORDER

Masaaki Sato, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Apr. 18, 1979, Ser. No. 31,334
Claims priority, application Japan, Apr. 19, 1978, 53/51486[U]
Int. Cl.[2] H04B 1/08; G11B 31/00
U.S. Cl. 455—344 18 Claims



1. A radio tuner, comprising a casing including a pair of casing portions, attaching means for releasably attaching said radio tuner to a tape recorder so that each of said casing portions abuts a corresponding one of a pair of sides of a tape recorder which is releasably attached to said radio tuner by said attaching means, first antenna means housed within one of said pair of casing portions for receiving a first type of radio signal and second antenna means housed within the other of said pair of casing portions for receiving a second type of radio signal.

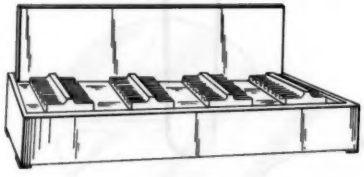
DESIGNS

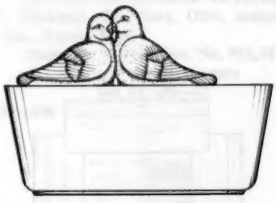
NOVEMBER 11, 1980

257,496
VIDEO-TAPE CABINET
Joseph L. Berkman, 48 Country Rd., Mamaroneck, N.Y. 10543
Filed Oct. 5, 1978, Ser. No. 948,812
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D3—35

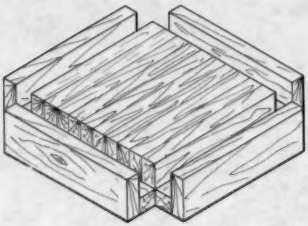
257,498
HEART-SHAPED DISH
Martin J. Waterfield, Birmingham, Mich., assignor to Florists' Transworld Delivery Association, Southfield, Mich.
Filed Jun. 1, 1979, Ser. No. 44,710
Term of patent 7 years
Int. Cl. D07—*01;* D11—*02*
U.S. Cl. D7—5

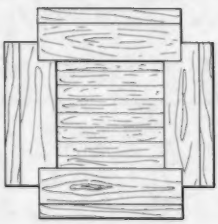
257,497
EYEGLASS DISPLAY HOLDER
Robert P. Franklin, Lake Hopatcong, and John G. Dewees, Morristown, both of N.J., assignors to Trans-World Manufacturing Corporation
Filed Mar. 12, 1979, Ser. No. 19,857
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—157





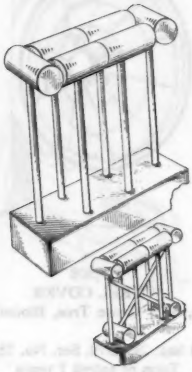
257,499
SNACK BOARD
Stewart D. Rogers, 3516 Euclid, Dallas, Tex. 75250
Filed Jan. 15, 1979, Ser. No. 3,549
Term of patent 14 years
Int. Cl. D07—*99, 04*
U.S. Cl. D7—37



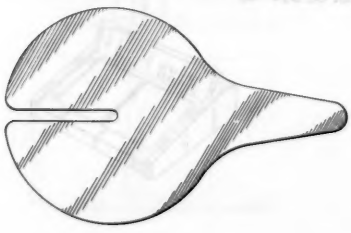


257,500
FROZEN CONFECTION MOLD
Charles A. Lanius, Prarie du Sac, Wis., assignor to Flambeau Products Corporation
Filed Feb. 23, 1979, Ser. No. 14,377
Term of patent 14 years
Int. Cl. D15—*08;* D07—*04*
U.S. Cl. D7—44

257,501
COMBINED CRAB MALLET SET AND SUPPORT STAND
Stephen J. Evan, 6514 Midra Dr., Lanham, Md. 20801
Filed Aug. 31, 1978, Ser. No. 938,489
Term of patent 14 years
Int. Cl. D07—*06*
U.S. Cl. D7—101



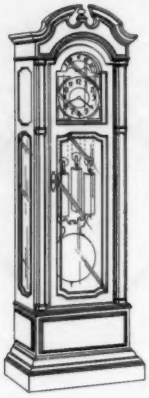
257,502
TOOL USED IN TRANSPLANTING POTTED PLANTS
Charles F. Viel, III, 138 Maple St., Wilmington, Del. 19808
Filed Sep. 1, 1978, Ser. No. 939,140
Term of patent 14 years
Int. Cl. D8—*99*
U.S. Cl. D8—1



257,503
SINGLE CHANNEL ROLL BAR FOR RETRACTABLE AWNINGS
Donald S. McKee, Louisville, Colo., assignor to The Scott & Fetzer Company, Lakewood, Ohio
Filed Feb. 1, 1979, Ser. No. 8,321
Term of patent 14 years
Int. Cl. D8—*09*
U.S. Cl. D8—376

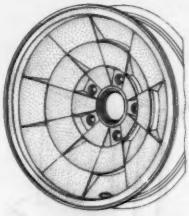
257,504
BOTTLE OR SIMILAR ARTICLE
Richard L. Weckman, Perryburg, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio
Filed Dec. 4, 1978, Ser. No. 966,247
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—408

257,505
FLOOR CLOCK
Arthur Umanoff, Ardsley, N.Y., assignor to Howard Miller Clock Company, Zealand, Mich.
Filed Jan. 9, 1979, Ser. No. 2,063
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—16

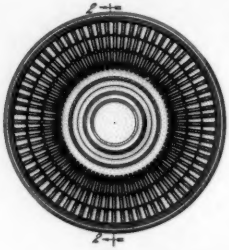


257,506
SPINDLE FOR A LOBSTER TRAP BUOY
Emile Plante, 74 Badgers Island, Kittery, Me. 03904
Filed Sep. 15, 1978, Ser. No. 942,678
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—121

257,507
VEHICLE WHEEL
David S. McIntosh, 30187 Pierce, Southfield, Mich. 48076
Filed May 24, 1979, Ser. No. 42,065
Term of patent 7 years
Int. Cl. D12—*16*
U.S. Cl. D12—211



257,508
WHEEL COVER
John R. Schinella, 3317 Green Tree, Bloomfield Hills, Mich. 48013
Filed Sep. 24, 1979, Ser. No. 78,670
Term of patent 7 years
Int. Cl. D12—*16*
U.S. Cl. D12—204



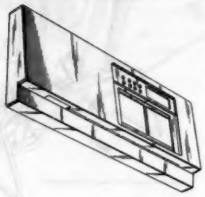
257,509
COMPUTER CONSOLE
Robert S. Fow, Tustin; Michael H. Tooke, Calabasas, and Ronald E. Loosen, Malibu, all of Calif., assignors to Computer Automation, Irvine, Calif.
Filed Jun. 13, 1978, Ser. No. 915,219
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—40

257,510

COMPUTER CONSOLE

Robert S. Fow, Tustin; Michael H. Tooke, Calabasas, and Ronald E. Loosen, Malibu, all of Calif., assignors to Computer Automation, Irvine, Calif.

Filed Jun. 13, 1978, Ser. No. 915,220
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—40

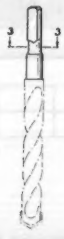


257,511

DRILL TOOL OR THE LIKE

Hajo Zahn, Guilford, Conn., assignor to Olin Corporation, New Haven, Conn.

Filed Sep. 8, 1975, Ser. No. 611,034
Term of patent 14 years
Int. Cl. D8—*01*
U.S. Cl. D15—139

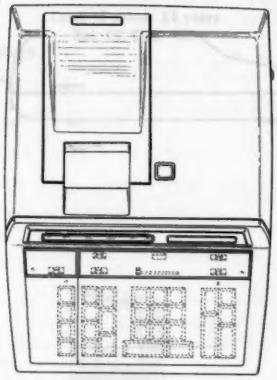


257,512

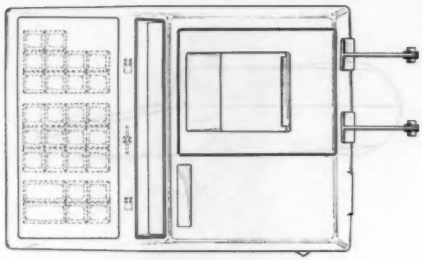
CALCULATOR CASE

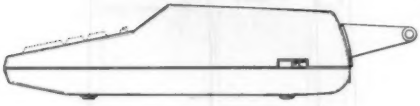
Terry L. Barner, Morris Plains; Stuart D. Leer, Budd Lake, and Myron Beitler, West Orange, all of N.J., assignors to Litton Business Systems, Inc.

Filed May 16, 1978, Ser. No. 906,520
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D18—7



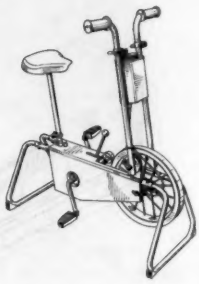
257,513
CASE FOR CALCULATING MACHINE
Joseph Sereika, Stanhope, and Myron Beitler, West Orange, both of N.J., assignors to Litton Business Systems, Inc.
Filed May 24, 1978, Ser. No. 909,280
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D18—7



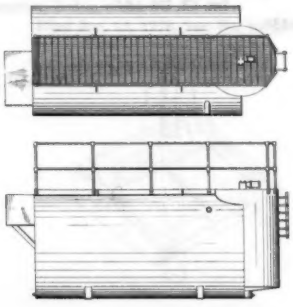


257,514
DINOSAUR FIGURE
Tatuya Kodaka, 25-6, 1-Chome, Wakamiya, Nakano-ku, Tokyo, Japan
Filed Nov. 28, 1978, Ser. No. 964,309
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—154

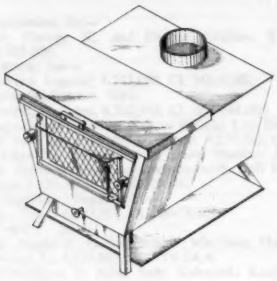
257,515
BICYCLE EXERCISER
Alfred W. Faux, Shelburne, Canada, assignor to Homeware Industries Limited
Filed Jul. 27, 1978, Ser. No. 928,845
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—194



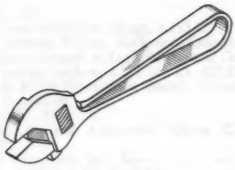
257,516
SEWAGE TREATMENT PLANT OR THE LIKE
James A. Mixon, 5050 Stepp Ave., Jacksonville, Fla. 32216
Filed Mar. 1, 1978, Ser. No. 882,961
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—3



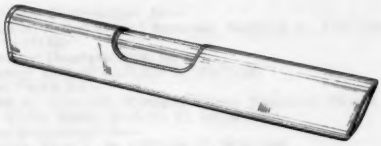
257,517
COMBINED FIREPLACE AND HEATING STOVE
Edwin S. F. Francis, 3930 Hobbs St., Victoria, British Columbia, Canada
Filed May 16, 1979, Ser. No. 39,501
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—97



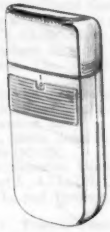
257,518
CLIP
John Herman, 8264 Gould Ave., Los Angeles, Calif. 90046
Filed Oct. 18, 1978, Ser. No. 952,563
Term of patent 14 years
Int. Cl. D27—*02;* D8—*05*
U.S. Cl. D27—02



257,519
GAS-LIGHTER
Lisio Plozner, Pordenone, Italy, assignor to B.P.T. S.p.A., Cinto Caomaggiore, Italy
Filed Mar. 28, 1978, Ser. No. 890,897
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D27—42



257,520
ELECTRIC SHAVER
Roland Ullmann, Hausen, Fed. Rep. of Germany, assignor to Braun Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany
Filed Dec. 14, 1978, Ser. No. 970,024
Claims priority, application Fed. Rep. of Germany, Jun. 19, 1978, 738701
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—49



257,619

COMBINED FIREPLACE AND HEATING STOVE

Edwin S. F. Preuss, 2940 18th St., Boulder, 80302

Filed May 16, 1979, Ser. No. 39,591

U.S. Cl. 126—77

257,619

CLIP

Lidia Thorens, 8304 Cedar Ave., Los Angeles, Calif. 90044

Filed Dec. 18, 1978, Ser. No. 970,262

Term of patent 14 years

Int. Cl. B27—5/02; D8—02

U.S. Cl. D27—67

257,619

CASSEROLETTE

Lidia Thorens, Avenue, Belgium, assignor to S.F.R. S.p.A., Cinto Caseggiato, Italy

Filed Dec. 28, 1978, Ser. No. 974,178

Claims priority, application Italy, Aug. 10, 1978, 69,178/78

Term of patent 14 years

Int. Cl. D27—01

U.S. Cl. D27—67

257,620

ELECTRIC HEATER

Roland Ullmann, Vienna, Fed. Rep. of Germany, assignor to Braun Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 14, 1978, Ser. No. 970,022

Claims priority, application Fed. Rep. of Germany, Aug. 19, 1978, 7827781

Term of patent 14 years

Int. Cl. D27—99

U.S. Cl. D23—40

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TO WHOM

PATENTS WERE ISSUED ON THE 11TH DAY OF NOVEMBER, 1980

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

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Muller, George H.; and Downs, William T., 4,232,803, Cl. 222-105.000.

AB Asea-Atom: *See—*
Vesterlund, Gunnar, 4,233,086, Cl. 148-6.300.

AB Broderna Kjellstrom: *See—*
Sauerwein, Georges, 4,232,965, Cl. 356-144.000.

Abe, Masayuki; and Fujihira, Yuji, to Hitachi, Ltd. Deflection yoke for use with wide angle deflection system. 4,233,582, Cl. 335-213.000.

Abolins, Visvaldis; Holub, Fred F.; and Shenian, Popkin R. Flame resistant thermoplastic compositions with well balanced physical properties. 4,233,199, Cl. 260-30.60R.

Aciers et Outillage Peugeot: *See—*
Pouget, Rene, 4,233,521, Cl. 290-38.00B.

Acla, Howard L.: *See—*
Ritsko, Joseph E.; Culkin, John J.; MacInnis, Martin B.; and Acla, Howard L., 4,233,063, Cl. 75-0.5AA.

Adachi, Yoshiharu, to Aisin Seiki Kabushiki Kaisha. Flow divider valve. 4,232,701, Cl. 137-101.000.

Adams, Jay W. Video camera with adjustable mount and counterbalance. 4,233,634, Cl. 358-229.000.

Ado, Kazuaki; Nobuoka, Soichiro; and Asai, Takashi, to Agency of Industrial Science & Technology, Ministry of International Trade & Industry. Method for manufacture of iron oxide flakes. 4,233,283, Cl. 423-633.000.

Aerojet-General Corporation: *See—*
Wrightson, John M., 4,232,608, Cl. 102-103.000.

Agency of Industrial Science and Technology: *See—*
Asai, Michihiko; Suda, Yoshio; Imada, Kiyoshi; Ueno, Susumu; and Nomura, Hirokazu, 4,233,419, Cl. 525-288.000.

Agency of Industrial Science & Technology, Ministry of International Trade & Industry: *See—*
Ado, Kazuaki; Nobuoka, Soichiro; and Asai, Takashi, 4,233,283, Cl. 423-633.000.

AGFA-Gevaert, A.G.: *See—*
Nittel, Fritz; Czernik, Karl; Sauerteig, Wolfgang; Himmelmann, Wolfgang; and Bergthaller, Peter, 4,233,398, Cl. 430-495.000.

AGFA-GEVAERT N.V.: *See—*
Kerkhofs, Jacques G., 4,233,346, Cl. 427-345.000.

Aharoni, Shaul M.; Sibilia, John P.; and Kozlowski, Deborah R., to Allied Chemical Corporation. Mesomorphic isocyanate extended rigid polymers. 4,232,951, Cl. 350-350.00R.

Ahlgren, David T.: *See—*
Remick, David W.; and Ahlgren, David T., 4,232,492, Cl. 52-172.000.

Ahlstroem, Bengt: *See—*
Jarder, Lars; and Ahlstroem, Bengt, 4,233,523, Cl. 307-119.000.

Aichert, Hans; Dietrich, Walter; Hoffmann, Otto-Horst; Stark, Friedrich; and Stephan, Herbert, to Leybold-Heraeus GmbH. Method for vapor-coating turbine buckets. 4,233,342, Cl. 427-251.000.

Aigner, Georg, to KDM Eleckronik GmbH. Flowmeter for liquids. 4,232,550, Cl. 73-258.000.

Ainsworth, Oliver C.: *See—*
Raines, Dale A.; and Ainsworth, Oliver C., 4,233,221, Cl. 260-340.200.

Air Products and Chemicals, Inc.: *See—*
Tao, John C., 4,233,038, Cl. 55-33.000.

Aisin Seiki Kabushiki Kaisha: *See—*
Adachi, Yoshiharu, 4,232,701, Cl. 137-101.000.
Kuki, Nobuyuki, 4,232,892, Cl. 292-347.000.
Maeda, Hiroaki, 4,232,568, Cl. 74-687.000.
Ochiai, Takeshi; Muto, Masahito; Sakakibara, Naoji; and Kawata, Shoji, 4,232,757, Cl. 180-176.000.
Suzuki, Mitsuyuki; and Ohmi, Atsushi, 4,232,518, Cl. 60-535.000.

Aizawa, Tatsuo; Kozuka, Nobuhiko; and Hasegawa, Yuji, to Mita Industrial Co., Ltd. Method of removing residual toner from surface of photoconductive member for use in electrostatic copying apparatus of the transfer type. 4,233,386, Cl. 430-125.000.

Akagi, Kazuo: *See—*
Tamura, Masamitu; Yasuhara, Yukio; Nakamura, Shigeharu; Sakai, Masaru; Akagi, Kazuo; Kazihata, Ryohei; and Satohara, Norio, 4,233,108, Cl. 156-639.000.

Akashi, Shunji, to Yoshida Kogyo K.K. Slide fastener. 4,232,431, Cl. 24-205.11R.

Akashi, Shunji, to Yoshida Kogyo K.K. Separable slide fastener. 4,232,432, Cl. 24-205.11R.

Akiyama, Toshiyuki, to Hitachi, Ltd. Solid state image pickup device with suppressed so-called blooming phenomenon. 4,233,632, Cl. 358-212.000.

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Bergstrand, Sten H. A. M.; Kjellin, Per G.; Persson, Carl G. A.; and Sorenby, Lars M., 4,233,303, Cl. 424-253.000.

Aktiebolaget Elektrokoppar: *See—*
Sundin, Anders O.; and Bronnvall, Wolfgang A., 4,233,066, Cl. 75-142.000.

Aktiebolaget Garphytte Bruk: *See—*
Lanner, Christer, 4,233,089, Cl. 148-36.000.

Akutsu, Eisaku: *See—*
Murata, Toshinori; Matsuura, Shigeo; Miyamoto, Hiroshi; and Akutsu, Eisaku, 4,233,591, Cl. 340-347.0DA.

Akzona Incorporated: *See—*
Bolick, Virgil T., Jr., 4,232,444, Cl. 29-863.000.
Hof, Craig R.; and Ulin, Roy A., 4,232,552, Cl. 73-356.000.

Alberkrack, Jade H., to Motorola, Inc. Switching power supply. 4,233,557, Cl. 323-9.000.

Albero, Rafael P. Method for printing and flocking fabrics simultaneously. 4,233,027, Cl. 8-488.000.

Albertson, Orris E.: *See—*
Fitch, Elliot B.; and Albertson, Orris E., 4,232,614, Cl. 110-235.000.

Albinger, Rolf. Labelling devices for tape cassettes including an adhesive applying device, label applying device, a pressure device, and a turn over roll. 4,233,105, Cl. 156-559.000.

Alcock, Derrick N.: *See—*
Iverson, James R.; and Alcock, Derrick N., 4,233,643, Cl. 361-344.000.

Aleck, Benjamin J., to Grumman Aerospace Corporation. Thermal emission flaw detection method. 4,232,554, Cl. 73-577.000.

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Allan, Thomas T., to Flanders Filters, Inc. Self-cleaning fluid sealed air filter. 4,233,044, Cl. 55-355.000.

Allen, Douglas T.: *See—*
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Allen, Edward A.; Phillips, Peter C.; and Smithson, Terence, to National Research Development Corporation. Additives for aviation and similar fuels. 4,233,035, Cl. 44-73.000.

Allen, Holless W.; and Allen, Douglas T. Bow string trigger release. 4,232,649, Cl. 124-35.00A.

Allen, Joseph C., to Texaco Inc. Composition for recovering hydrocarbons. 4,233,166, Cl. 252-8.55D.

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Allgaier, Joseph M.; Richens, Jack W.; and Leekha, Rajendra K., to Continental Group, Inc., The. Tennis ball can filler. 4,232,717, Cl. 141-179.000.

Allgulin, Torkel, to Boliden Aktiebolag. Method of extracting and recovering mercury from gases. 4,233,274, Cl. 423-210.000.

Allied Chemical Corporation: *See—*
Aharoni, Shaul M.; Sibilia, John P.; and Kozlowski. Deborah R., 4,232,951, Cl. 350-350.00R.
Balint, Laszlo J.; Crescentini, Lamberto; Fisher, William B.; and Sahli, Muhammad S., 4,233,279, Cl. 423-385.000.
Ratcliffe, Charles T.; and Yardley, James T., 4,233,131, Cl. 204-162.00R.
Rothmayer, Noel Y.; Keusch, Preston; and Kattermann, Dietrich E., 4,233,146, Cl. 204-255.000.
Stephenson, Robert L., 4,232,882, Cl. 280-804.000.

Altenburger Maschinen KG Jaeckering & Co.: *See—*
Wieg, Andras J.; and Jackering, Gunther, 4,233,406, Cl. 435-275.000.

Altman, Norman G., to Teledyne, Inc. Television monitoring system for automatically aligning semiconductor devices during manufacture. 4,233,625, Cl. 358-101.000.

Aluminum Company of America: *See—*
Brown, Melvin H., 4,232,615, Cl. 110-342.000.

Alvarez-Sabater, Fernando. Gravity-feed rotary tray slide projector. 4,232,953, Cl. 353-111.000.

Aly, Fawzy: *See—*
Jehle, Felix A.; and Aly, Fawzy, 4,233,324, Cl. 426-96.000.

Amancharla, Amareswar, to Baker International Corporation. Wireline releasable seal connector for wellpipe strings. 4,232,888, Cl. 285-18.000.

Amax Inc.: *See—*
Meyer, Gustavo A.; Fekete, Simon O.; and Wicker, Gordon R., 4,233,273, Cl. 423-112.000.

Amerace Corporation: *See—*
Johnson, Glenn W., Jr.; and Heenan, Sidney A., 4,232,979, Cl. 404-16.000.

American Can Company: *See*—
Gallivan, Robert M.; and Mattschei, Peter K., 4,233,465, Cl. 568-727.000.
Lemke, Harold C.; and Rohowetz, Stanley E., 4,233,331, Cl. 426-407.000.
Ticknor, William G.; and Rein, Arnold R., 4,233,367, Cl. 428-476.300.

American Cyanamid Company: *See*—
Bright, John H.; and Schmitt, Joseph L., Jr., 4,233,458, Cl. 562-458.000.
Floyd, Middleton B., Jr.; Grudzinskas, Charles V.; and Chen, Sow-Mei L., 4,233,231, Cl. 260-429.700.
Floyd, Middleton B., Jr., 4,233,453, Cl. 560-121.000.
Linke, William F.; and Marzluff, William F., 4,233,240, Cl. 564-4.000.
Wang, Samuel S.; and Smith, Eugene L., Jr., 4,233,150, Cl. 209-166.000.

American Home Products Corporation: *See*—
Ledig, Kurt W., deceased; and Howes, David R., Executor, 4,233,445, Cl. 544-250.000.
Scotese, Anthony C.; Morris, Robert L.; and Santilli, Arthur A., 4,233,446, Cl. 544-279.000.

American Optical Corporation: *See*—
Swaminathan, Krishnaiyer; and Sussman, Milton H., 4,232,937, Cl. 350-91.000.

Amtrol Inc.: *See*—
Becker, Bernard S.; Bowman, John K.; and Randall, Cyril A., 4,232,704, Cl. 137-218.000.

Anchor Hocking Corporation: *See*—
Springer, Donald A., 4,232,789, Cl. 206-562.000.

Andersen, Axel B. Photographic accessory apparatus. 4,233,647, Cl. 362-16.000.

Andersen, Niels J., to Cabinplant A/S. Machine for automatically filling cans. 4,232,503, Cl. 53-517.000.

Anderson, Mark J.: *See*—
Miller, J. Wayne; and Anderson, Mark J., 4,233,034, Cl. 44-1.0SR.

Anderson, Norman C.: *See*—
Rupert, Robert E., 4,233,512, Cl. 250-338.000.

Anderson-Shanklin, Gene C., to University of Illinois Foundation. Apparatus and method for determining newborn infant feeding capability. 4,232,687, Cl. 128-777.000.

Anderson, Stanley E.: *See*—
Shea, James M.; Tobin, Michael F.; and Anderson, Stanley E., 4,232,585, Cl. 91-432.000.

Ando, Momofuku; Minami, Junichi; Takata, Mitsumune; Ohnishi, Fumio; and Kawamoto, Shunichi, to Momofuku Ando. Process for producing instant-cooking rice. 4,233,327, Cl. 426-242.000.

Andres, Harald: *See*—
Kolbel, Hans J.; and Andres, Harald, 4,232,881, Cl. 280-721.000.

Andrews Maclaren Ltd.: *See*—
Maclaren, Owen F., deceased; Barber, William L., executor; and Maclaren, Marie I., executor, 4,232,897, Cl. 297-45.000.

Andros Incorporated: *See*—
Elder, William L.; Williams, Kevin G.; and Burough, Irvin G., 4,233,513, Cl. 250-343.000.

Antipov, Georgy A.; Gelfand, Mikhail L.; Goldshtein, Boris G.; Rutgaizer, Mikhail I.; Suut, Nikolai K.; Tsipenjuk, Yakov I.; Shishulin, Jury P.; Galimov, Apas G.; Sutyagin, Oleg Y.; and Yankovsky, Oleg A. Impact wrench with a rotary tool drive. 4,232,750, Cl. 173-93.600.

Antonelli, Sergio; and Borza, Michele, to Snamprogetti, S.p.A. Process for regenerating exhausted oils. 4,233,140, Cl. 208-180.000.

Aomi, Hideki: *See*—
Enjo, Naonori; and Aomi, Hideki, 4,232,525, Cl. 60-671.000.

Appels, Johannes A.: *See*—
Klaassen, Francois M.; and Appels, Johannes A., 4,233,617, Cl. 357-23.000.

Appleton Papers Inc.: *See*—
Becker, William J.; Farber, Sheldon; and Hoover, Troy E., 4,232,887, Cl. 282-27.500.

Aqua-Retain Valve, Inc.: *See*—
Ray, Robert T., Sr.; and Pickett, Richard G., 4,232,711, Cl. 138-44.000.

Aquila Steel Company, Ltd.: *See*—
Turner, Raymond, 4,232,845, Cl. 248-49.000.

Arai, Hajime: *See*—
Sato, Yoshiaki; and Arai, Hajime, 4,233,355, Cl. 428-224.000.

Arcozzi, Giovanni: *See*—
Savelli, Aulo; Grianti, Francesco; Arcozzi, Giovanni; and Di Bari, Leonardo, 4,232,666, Cl. 128-203.250.

Arendt, Ronald H., to General Electric Company. Molten salt synthesis of barium and/or strontium titanate powder. 4,233,282, Cl. 423-598.000.

Argus Chemical Corporation: *See*—
Leistner, William E.; Minagawa, Motonobu; Nakahara, Yutaka; and Haruna, Tohru, 4,233,414, Cl. 525-146.000.

Armstrong, Colin; and Walbridge, Derek J., to Imperial Chemical Industries Limited. Shaped polymeric articles made by two-stage photopolymerization. 4,233,396, Cl. 430-320.000.

Armstrong Cork Company: *See*—
Heckles, John S., 4,233,239, Cl. 564-57.000.

Arndt, Friedrich: *See*—
Kruger, Hans-Rudolf; Arndt, Friedrich; Baumert, Dietrich; Joppien, Hartmut; Pieroh, Ernst A.; and Rusch, Reinhart, 4,233,059, Cl. 71-92.000.

Arnold, Dan M., to Texaco Inc. Water injection profiling. 4,233,508, Cl. 250-259.000.

Artag Plastics Corporation: *See*—
Fagan, John C., 4,233,660, Cl. 364-104.000.

Arthur D. Little, Inc.: *See*—
Teagan, W. Peter, 4,232,656, Cl. 126-420.000.

Arthurs, Eugene G.; and Purdie, Anthony F., to Barr & Stroud Limited. Dye laser tuner. 4,233,572, Cl. 331-94.50M.

Asahi, Hirozi: *See*—
Suzuki, Yasoji; Ochii, Kiyofumi; and Asahi, Hirozi, 4,233,672, Cl. 365-181.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Nagashima, Hironobu; Tuda, Koji; and Marui, Masatoshi, 4,232,685, Cl. 128-773.000.

Asai, Masahiro, to Nippondenso Co., Ltd. Ignition system for internal combustion engines with a magneto generator. 4,232,646, Cl. 123-600.000.

Asai, Michihiko; Suda, Yoshio; Imada, Kiyoshi; Ueno, Susumu; and Nomura, Hirokazu, to Agency of Industrial Science and Technology; and Shin-Etsu Chemical Co., Ltd. Method for preventing plasticizer bleeding on polyvinyl chloride shaped articles. 4,233,419, Cl. 525-288.000.

Asai, Takashi: *See*—
Ado, Kazuaki; Nobuoka, Soichiro; and Asai, Takashi, 4,233,283, Cl. 423-633.000.

Asakawa, Kobun: *See*—
Sato, Kunihiko; Urata, Tetsuro; Asamoto, Tetsuhiro; Asakawa, Kobun; Uebayashi, Takeo; and Kawano, Mitugi, 4,233,485, Cl. 219-69.00M.

Asamoto, Tetsuhiro: *See*—
Sato, Kunihiko; Urata, Tetsuro; Asamoto, Tetsuhiro; Asakawa, Kobun; Uebayashi, Takeo; and Kawano, Mitugi, 4,233,485, Cl. 219-69.00M.

Asano, Shuichi: *See*—
Ueda, Takeo; Fujita, Shinichi; Tachiki, Hideo; and Asano, Shuichi, 4,232,433, Cl. 24-230.00A.

ASEA Aktiebolag: *See*—
Wiberg, Karl-Gunnar, 4,233,096, Cl. 156-49.000.

Associated Equipment Corporation: *See*—
Baumbach, Dale M., 4,233,552, Cl. 320-7.000.

Ateya, Antoun I.; and Stryjewski, Walter A., to Eastman Kodak Company. Toner image fusing apparatus. 4,232,959, Cl. 355-3.0FU.

Atkins, Philip A. Canopy frame. 4,232,692, Cl. 135-5.100.

Atkinson, James T. N.; and Sahoo, Maheswar, to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Magnesium-lithium alloy. 4,233,376, Cl. 429-199.000.

Atlantic Richfield Company: *See*—
Hill, Robert C.; Nielson, Niel E.; Kreiling, Ronald L.; and Nice, Ralph A., 4,233,152, Cl. 210-703.000.

Atlas Copco Aktiebolag: *See*—
Dick, Helmut, 4,232,905, Cl. 299-31.000.
Kimber, Erich V., 4,232,848, Cl. 248-652.000.
Kimber, Erich V.; and Lundstrom, Axel L., 4,232,849, Cl. 248-654.000.
Kimber, Erich V.; and Hokby, Nils, 4,232,850, Cl. 248-654.000.

ATC Chimie: *See*—
Kern, Rene; and Augustin, Daniel, 4,233,236, Cl. 260-504.00S.

Atwater, Stephen K.; and Wolfson, Joseph. Kaleidoscopic toy. 4,232,932, Cl. 350-4.100.

Atwood, Kenton; Wright, James H.; and Merriam, Jay S., to United Catalysts Inc. Catalyst and process for steam-reforming of hydrocarbons. 4,233,187, Cl. 252-466.00J.

Audi NSU Auto Union Aktiengesellschaft: *See*—
Bathelt, Hartmut, 4,232,756, Cl. 180-70.00P.

Aue, Kazuhide: *See*—
Saito, Shunjiro; Aue, Kazuhide; Kobayashi, Makoto; and Nakamura, Akio, 4,233,340, Cl. 427-125.000.

August Incorporated: *See*—
Fister, Lee H., Jr., 4,232,899, Cl. 297-229.000.

Augustin, Daniel: *See*—
Kern, Rene; and Augustin, Daniel, 4,233,236, Cl. 260-504.00S.

Augustine, Robert F., to Kelsey Hayes Co. Electric braking system. 4,233,587, Cl. 338-96.000.

Ault, Inc.: *See*—
Prince, Luther T., Jr.; Hampel, Wilbur J.; and Boot, Michael A., 4,233,553, Cl. 320-23.000.

Auto-Weber GmbH & Co. KG: *See*—
Kijewski, Joachim, 4,232,893, Cl. 294-82.0AH.

Automecha Ltd.: *See*—
Brown, Frank H., 4,232,860, Cl. 271-119.000.

Autovox, SpA: *See*—
Dellantonio, Ezio F., 4,232,560, Cl. 74-10.330.

Auyeung, Sean; and Etzel, William W., to Combustion Engineering, Inc. Fuel storage rack. 4,233,518, Cl. 250-507.000.

B. F. Goodrich Company, The: *See*—
Fisher, John M., 4,233,102, Cl. 156-292.000.

Babbitt, Frederick J.; and Carnine, Daniel K. Energy conservation refrigeration unit. 4,232,529, Cl. 62-160.000.

Babcock & Wilcox Company, The: *See*—
Stump, Paul E., 4,232,541, Cl. 72-283.000.

Backlund, Anders D. Heating and ventilation system. 4,232,821, Cl. 237-2.00B.

Baehr, Donald O.; and Izard, David G., to United States Gypsum Company. Method for the production of glass fiber-reinforced gypsum sheets and gypsum board formed therefrom. 4,233,368, Cl. 428-538.000.

Baffle Stove Company Inc.: *See*—
Frank, Bruce A., 4,232,650, Cl. 126-77.000.

Baier, Robert E., to Calspan Corporation. Method for testing for the presence of pathogens. 4,233,404, Cl. 435-30.000.

Baker, Alfred L.: *See*—
Payne, Thomas R.; and Baker, Alfred L., 4,233,498, Cl. 219-490.000.

Baker, Don R.: *See*—
Fancher, Llewellyn W.; and Baker, Don R., 4,233,318, Cl. 424-326.000.

Baker, Edward B.: *See*—
Harmon, George L.; Monroe, Ronald D.; Munday, Thomas M.; Jones, Clarence E.; and Baker, Edward B., 4,232,456, Cl. 35-25.000.

Baker International Corporation: *See*—
Amancharla, Amareswar, 4,232,888, Cl. 285-18.000.

Baker, Roy F.; and Banach, Frank, to Zenith Radio Corporation. Circuit for modifying the IF response of a television receiver. 4,233,630, Cl. 358-167.000.

Balda-Werke Photographische Gerate und Kunststoff GmbH & Co. KG: *See*—
Lange, Karl-Heinz, 4,232,936, Cl. 350-75.000.

Balderes, Demetrios; Lynch, John R.; and Yacavonis, Robert A., to International Business Machines Corporation. Semiconductor package with improved conduction cooling structure. 4,233,645, Cl. 361-385.000.

Baldwin-Gegenheimer GmbH, Firma: *See*—
Waizmann, Franz, 4,232,604, Cl. 101-425.000.

Baldwin, John J.; and Lumma, William C., Jr., to Merck & Co., Inc. Novel imidazoazines and imidazodiazines. 4,233,301, Cl. 424-250.000.

Balint, Laszlo J.; Crescentini, Lamberto; Fisher, William B.; and Sahli, Muhammad S., to Allied Chemical Corporation. Process for the synthesis of ammonium nitrite. 4,233,279, Cl. 423-385.000.

Ball Corporation: *See*—
Sanford, Gary G.; Munson, Robert E.; and Metzler, Thomas A., 4,233,607, Cl. 343-700.0MS.

Balle, Gerhard: *See*—
Suling, Carlhans; Balle, Gerhard; Walkowiak, Michael; and Schulz, Hans-Hermann, 4,233,424, Cl. 525-440.000.

Ballweber, Edward G.; Jansma, Roger H.; and Phillips, Kenneth G., to Nalco Chemical Co. Cationic polymeric composition for imparting wet and dry strength to pulp and paper. 4,233,411, Cl. 525-155.000.

Banach, Frank: *See*—
Baker, Roy F.; and Banach, Frank, 4,233,630, Cl. 358-167.000.

Bando, Seiji; and Sadao, Ebata, to Kawasaki Steel Corporation. Steel stock cooling apparatus. 4,232,853, Cl. 266-114.000.

Banucci, Eugene G.: *See*—
Boldebuck, Edith M.; Banucci, Eugene G.; and Byrne, Martin A., 4,233,435, Cl. 528-350.000.

Barbakadze, Dzhondo F.; Mindeli, Mamuka S.; Macharashvili, Petr G.; Rusidze, Vazha V.; and Suladze, Otari N. Method of introducing powdered reagents into molten metals and apparatus for effecting same. 4,232,854, Cl. 266-266.000.

Barbeau, Dennis E., to Teledyne Industries, Inc. High intensity slinger type combustor for turbine engines. 4,232,526, Cl. 60-745.000.

Barber, S. Morgan. Therapeutic device for a human body. 4,232,662, Cl. 128-71.000.

Barber, William L., executor: *See*—
Maclaren, Owen F., deceased; Barber, William L., executor; and Maclaren, Marie I., executor, 4,232,897, Cl. 297-45.000.

Barbin, William W.: *See*—
Bohm, Georg G. A.; and Barbin, William W., 4,233,013, Cl. 425-174.400.

Bargain, Michel; and Prud'Homme, Christian, to Rhone-Poulenc Industries. Elastomeric organopolysiloxane block copolymers and non-elastomeric organosilicic copolymer blocks therefor. 4,233,427, Cl. 525-478.000.

Barker, John C.; and McLaughlin, Ivan P., to J. J. Barker Company Limited. Three-dimensional decorative surface. 4,233,343, Cl. 427-264.000.

Barone, Michael R., to General Electric Company. Prime mover having a leakage flux conducting device secured thereto. 4,233,535, Cl. 310-256.000.

Barr & Stroud Limited: *See*—
Arthurs, Eugene G.; and Purdie, Anthony F., 4,233,572, Cl. 331-94.50M.

Barry Wright Corporation: *See*—
Peterson, Robert R.; Ventura, Daniel S.; and Gureghian, Richard S., 4,232,563, Cl. 74-470.000.

Barta, Cestmir; Ctyroky, Jiri; Silvestrova, Iraida M.; and Pisarevskij, Jurij V., to Ceskoslovenska akademie ved. Acousto-optic device. 4,232,952, Cl. 350-358.000.

Bartels, Bruce E., to Wheelabrator Corp. of Canada. Shoe. 4,232,458, Cl. 36-45.000.

Bartholomew, Victor L.; and Havstad, Harold R., to Hudson Oxygen Therapy Sales Company. Therapeutic incent.ve spirometer. 4,232,683, Cl. 128-725.000.

Bartz, Wilfried: *See*—
Berger, Dieter; Bartz, Wilfried; and Seeliger, Wolfgang, 4,233,202, Cl. 260-348.360.

BASF Aktiengesellschaft: *See*—
Baumann, Manfred; and Hoffmann, Werner, 4,233,464, Cl. 568-591.000.
Dudeck, Christian; Lehmann, Gunter; Petri, Norbert; Diem, Hans; Fliege, Werner; Meissner, Bernd; Ross, Karl-Heinz; and Muehlthaler, Wolfgang, 4,233,246, Cl. 568-402.000.
Hoerauf, Werner; Valentin, Guenter; Kegel, Robert; and Kuhn, Helmut, 4,233,429, Cl. 526-71.000.
Kilpper, Gerhard; and Grimmer, Johannes, 4,233,459, Cl. 567-458.000.
Langens, Jan; and Devroe, Guido, 4,233,280, Cl. 423-481.000.
Mueller, Herbert; and Huchler, Otto H., 4,233,228, Cl. 260-346.110.
Rotzoll, Rudi-Heinz; Duffner, Paul; Dietl, Ernst; Pilz, Georg; and Thiel, Gerhard, 4,233,234, Cl. 260-501.200.
Scholz, Herbert, 4,233,450, Cl. 548-226.000.
Seibert, Walter, 4,233,223, Cl. 260-343.400.
Weitz, Hans-Martin; Hartig, Juergen; and Marosi, Laszlo, 4,233,455, Cl. 560-244.000.

Bastek, John J., to Bell Telephone Laboratories, Incorporated. Contact structure for light emitting device. 4,232,440, Cl. 29-590.000.

Bate, Gary W.: *See*—
Coker, Robert J.; Bate, Gary W.; and Deuzeman, Henk J., 4,233,267, Cl. 422-187.000.

Bathelt, Hartmut, to Audi NSU Auto Union Aktiengesellschaft. Motor-vehicle drive-shaft assembly. 4,232,756, Cl. 180-70.00P.

Bauch, Tamil D.; and Starr, Hank, to Bauch, Tamil D. Composite construction panel. 4,232,494, Cl. 52-221.000.

Bauer, Harvey E. Tethered top usable in two ways. 4,232,475, Cl. 46-61.000.

Baumann, Manfred; and Hoffmann, Werner, to BASF Aktiengesellschaft. Cyclohexene carotinoid intermediates. 4,233,464, Cl. 568-591.000.

Baumbach, Bertram W., to Reliable Electric Company. Line protector for a communications circuit. 4,233,641, Cl. 361-119.000.

Baumbach, Dale M., to Associated Equipment Corporation. Vehicle-starting circuit with excessive voltage detection. 4,233,552, Cl. 320-7.000.

Baumert, Dietrich: *See*—
Kruger, Hans-Rudolf; Arndt, Friedrich; Baumert, Dietrich; Joppien, Hartmut; Pieroh, Ernst A.; and Rusch, Reinhart, 4,233,059, Cl. 71-92.000.

Baumgardt, Walter G.; Ondesko, John J.; and Zysman, Bernard K., to Hooker Chemicals & Plastics Corp. Moldable thermosetting phenol-aldehyde resin compositions and process for making the compositions. 4,233,203, Cl. 260-38.000.

Baumoel, Joseph. Liquid flow meter. 4,232,548, Cl. 73-861.280.

Baxter Travenol Laboratories, Inc.: *See*—
Dighe, Kamalakar D., 4,233,549, Cl. 318-317.000.
Martin, Jerry D.; Pearson, Stephen J.; Ward, Gary A.; and Winchell, David A., 4,232,721, Cl. 150-0.500.

Bayer Aktiengesellschaft: *See*—
Boehmke, Gunther, 4,233,214, Cl. 260-158.000.
Breig, Kurt; Dehmel, Georg; and Hamm, Norbert, 4,233,213, Cl. 260-141.000.
Dorlars, Alfons; and Neuner, Otto, 4,233,440, Cl. 542-458.000.
Fuchs, Rainer A.; Hammann, Ingeborg; and Behrenz, Wolfgang, 4,233,293, Cl. 424-200.000.
Idel, Karsten; Vernaleken, Hugo; Freitag, Dieter; Reiff, Gunther; and Rudolph, Hans, 4,233,431, Cl. 525-462.000.
Immel, Otto; and Schwarz, Hans-Helmut, 4,233,247, Cl. 568-464.000.
Kramer, Wolfgang; Buchel, Karl H.; Plempel, Manfred; and Haller, Ingo, 4,233,311, Cl. 424-273.00R.
Maurer, Fritz; Hammann, Ingeborg; and Behrenz, Wolfgang, 4,233,294, Cl. 424-200.000.
Sasse, Klaus; Beck, Gunther; Eue, Ludwig; and Schmidt, Robert R., 4,233,058, Cl. 71-92.000.
Schroer, Horst; Goliasch, Karl; and Beck, Uwe, 4,233,233, Cl. 260-465.00E.
Suling, Carlhans; Balle, Gerhard; Walkowiak, Michael; and Schulz, Hans-Hermann, 4,233,424, Cl. 525-440.000.

BBC Brown, Boveri & Company, Limited: *See*—
Behnke, Reinhold; Wagenbach, Wolfgang; and Muller, Erwin, 4,232,925, Cl. 339-31.00R.
Croes, Nicolaus; Horler, Hansulrich; and Kirchhofer, Hubert, 4,232,999, Cl. 417-64.000.
Dumont, Willy, 4,232,546, Cl. 73-40.700.

Beall, George H.; Mansfield, Gerald R.; and Schreurs, Jan W. H., to Corning Glass Works. Porous magnetic glass structure. 4,233,169, Cl. 252-62.590.

Beatty, Charles L.: *See*—
Bergen, Richard F.; and Beatty, Charles L., 4,233,388, Cl. 430-137.000.

Beaucamp, Claude, to GTE Products Corporation. Mechanism for static convergence devices for color television picture tubes. 4,233,581, Cl. 335-212.000.

Beavon, David K.; and Mackles, Mark, to Ralph M. Parsons Company, The. Process for removal of carbonyl sulfide in liquified hydrocarbon gases with absorption of acid gases. 4,233,141, Cl. 208-236.000.

Becht, George L.; Melachowski, Jerome A.; and Wolicki, Richard J., to Buffalo Brake Beam Company. Ladder assembly and method of making same. 4,232,760, Cl. 182-194.000.

Bechtel International Corporation: *See*—
Lee, Fred C., 4,232,981, Cl. 405-154.000.

Beck, Gunther: *See*—
Sasse, Klaus; Beck, Gunther; Eue, Ludwig; and Schmidt, Robert R., 4,233,058, Cl. 71-92.000.

Beck, Uwe: *See*—
Schroer, Horst; Goliasch, Karl; and Beck, Uwe, 4,233,233, Cl. 260-465.00E.

Becker, Bernard S.; Bowman, John K.; and Randall, Cyril A., to Amtrol Inc. In line back flow preventer. 4,232,704, Cl. 137-218.000.

Becker, Hans J.: *See—*
Eresen, Nahit; Schroer, Klaus; and Becker, Hans J., 4,233,272, Cl. 423-7.000.

Becker, William J.; Farber, Sheldon; and Hoover, Troy E., to Appleton Papers Inc. Lactone compounds containing an indolizine radical. 4,232,887, Cl. 282-27.500.

Beeghly, Lester R.; and Gilchrist, George E. Water closet ventilating system with vacuum breaker valve. 4,232,406, Cl. 4-213.000.

Behnke, Reinhold; Wagenbach, Wolfgang; and Muller, Erwin, to BBC Brown, Boveri & Company, Limited. High-voltage three phase electrical switch gear. 4,232,925, Cl. 339-31.00R.

Behr, Joseph L., to Emerson Electric Co. Frost detector. 4,232,528, Cl. 62-140.000.

Behrens, Klaus: *See—*
Richter, Karl M.; Harder, Hans E.; and Behrens, Klaus, 4,232,670, Cl. 128-224.000.

Behrenz, Wolfgang: *See—*
Fuchs, Rainer A.; Hammann, Ingeborg; and Behrenz, Wolfgang, 4,233,293, Cl. 424-200.000.
Maurer, Fritz; Hammann, Ingeborg; and Behrenz, Wolfgang, 4,233,294, Cl. 424-200.000.

Behrmann, Alfred E.: *See—*
Koch, Christian; and Behrmann, Alfred E., 4,233,036, Cl. 48-210.000.

Beier, Gerhard; and Matthies, Wolfgang. Sealing carrier pack for cans with beaded edge. 4,232,807, Cl. 224-45.00A.

Beisch, Hans R., to Norris Industries, Inc. Vehicle wheel with wheel cover and retaining clip. 4,232,907, Cl. 301-37.00R.

Bell, Alan E., to RCA Corporation. Playback information record using phase cancellation for reading. 4,233,626, Cl. 358-128.500.

Bell, Richard L.: *See—*
Johnson, Fred J.; and Bell, Richard L., 4,232,816, Cl. 229-33.000.

Bell Telephone Laboratories, Incorporated: *See—*
Bastek, John J., 4,232,440, Cl. 29-590.000.
Carlson, Eric R.; Schneider, Martin V.; and Trambarulo, Ralph F., 4,233,579, Cl. 333-204.000.
Wight, Frederick R., Jr., 4,233,470, Cl. 174-120.00C.

Beloit Corporation: *See—*
Burton, Frank, 4,232,455, Cl. 34-124.000.

Bendix Autolite Corporation: *See—*
Eifler, Raymond J.; Datwyler, Walter F., Jr.; Statland, Bernard E.; and Sher, Geoffrey, 4,233,033, Cl. 23-232.00E.

Bendix Corporation, The: *See—*
Casey, Gary L.; Blatter, Albert; Miller, John A.; and Claxton, William B., 4,232,830, Cl. 239-585.000.
Van Siclen, Howard E., Jr., 4,232,647, Cl. 123-478.000.

Benedetto, Kenneth R.; and Linder, Larry J., to KBG Corporation. Angular acceleration sensing apparatus. 4,232,553, Cl. 73-516.0LM.

Beneke, Wolfgang; Teichmann, Paul G.; and Weber, Wilfried, to Trutzschler GmbH & Co. KG. Web guiding device. 4,232,426, Cl. 19-106.00R.

Benham, Judith L., to Minnesota Mining and Manufacturing Company. Liquid crystal compositions including pleochroic dye. 4,232,950, Cl. 350-349.000.

Benin, Joshua, to Du Pont de Nemours, E. I., and Company. Bobbin chuck. 4,232,835, Cl. 242-46.400.

Benner, Harold T., Jr.: *See—*
Dieterlen, Paul E.; and Benner, Harold T., Jr., 4,232,504, Cl. 53-570.000.

Benson, Willard R., to United States of America, Army. Centrifugal ball cam locking device. 4,232,607, Cl. 102-56.00R.

Benton, Stephen L.: *See—*
Hammel, Richard L.; Schaefer, Robert H.; Lancia, Frederick N.; Wolfe, William A.; Dearth, Leonard F.; Benton, Stephen L.; Homan, H. Richard; and Bruce, Arthur P., 4,232,798, Cl. 221-12.000.

Berber, Viktor A.: *See—*
Grachev, Konstantin A.; Berber, Viktor A.; Sokolov, Viktor E.; Pavlov, Vladimir V.; Popov, Alexei N.; and Zolotenko, Vladimir A., 4,232,967, Cl. 356-336.000.

Bergen, Richard F.; and Beatty, Charles L., to Xerox Corporation. Method for making toner particles. 4,233,388, Cl. 430-137.000.

Berger, Dieter; Bartz, Wilfried; and Seeliger, Wolfgang, to Chemische Werke Huels Aktiengesellschaft. Process for the purification of epoxy compounds. 4,233,202, Cl. 260-348.360.

Berger, Henri, to Societe d'Applications Generales d'Electricite et de Mechanique (SAGEM). Numerically controlled machine tools particularly stitching or pricking machines. 4,233,550, Cl. 318-568.000.

Bergmann, Ewald: *See—*
Schneider, Franz; Braitinger, Helmut; Bergmann, Ewald; and Kurz, Otto, 4,232,575, Cl. 83-71.000.

Bergsand, Karl A., to Goteborgs Maskinkonsult AB. Device for treatment of articles with at least one treatment agent. 4,233,084, Cl. 134-67.000.

Bergstrand, Sten H. A. M.; Kjellin, Per G.; Persson, Carl G. A.; and Sorenby, Lars M., to Aktiebolaget Draco. Xanthine derivatives. 4,233,303, Cl. 424-253.000.

Bergthaller, Peter: *See—*
Nittel, Fritz; Czernik, Karl; Sauerteig, Wolfgang; Himmelmann, Wolfgang; and Bergthaller, Peter, 4,233,398, Cl. 430-495.000.

Bergwerksverband GmbH: *See—*
Hoberg, Heinz; and Klein, Albert, 4,233,559, Cl. 324-58.50A.
Juntgen, Harald; Knoblauch, Karl; Degel, Josef; Zundorf, Dieter; and Giessler, Klaus, 4,233,117, Cl. 201-6.000.

Berkshire, David C.: *See—*
Richardson, Edwin A.; Scheuerman, Ronald F.; Berkshire, David C.; Reisberg, Joseph; and Lybarger, James H., 4,232,741, Cl. 166-281.000.

Bernardis, Francesco; and Prevignano, Paolo, to Ing. C. Olivetti & C., S.p.A. Ribbon cartridge for printing machines and mechanism for feeding the ribbon. 4,232,976, Cl. 400-196.100.

Berry, Richard L., Jr. Safety fountain head. 4,232,825, Cl. 239-28.000.

Berthiaume, Raymond, to Hydro-Quebec. Stroboscopic beacons fed from a capacitive source. 4,233,546, Cl. 315-241.00R.

Besson, Rene; and Breguet, Jean-Luc, to Ebauches S.A. Method for the display of information. 4,232,464, Cl. 40-451.000.

Bezubik, Slawomir J.; and Laszcz, Stanislaw, to Fabryka Przyrzadow i Uchwytow PONAR-BIAL Zaklad Nr 1-Wiodacy. Machine vise. 4,232,857, Cl. 269-212.000.

Bicron Electronics Company: *See—*
Novacek, William G., 4,233,583, Cl. 335-236.000.

Bierlein, John C.; and Shipek, Edward J., to General Motors Corporation. Bearing having iron sulfur matrix. 4,233,071, Cl. 75-231.000.

Bigelow, John E., to General Electric Company. Capacitive touch control and display. 4,233,593, Cl. 340-365.00C.

Bilawsky, Paul D.: *See—*
Gross, Stephen E.; Cain, Clifford W., Jr.; Bilawsky, Paul D.; and Scheffel, Norman B., 4,233,379, Cl. 429-247.000.

Binoche, Michel, to S K M, Societe Anonyme. Method and apparatus for the pneumatic spraying of liquid products. 4,232,824, Cl. 239-8.000.

Birenbaum, Benjamin. Fuel injection system. 4,233,002, Cl. 417-485.000.

Black, Edward D.: *See—*
Comperatore, John A.; Wise, David J.; and Black, Edward D., 4,233,050, Cl. 65-107.000.

Blain, Jean R.: *See—*
Hurlow, Gerald S.; Blain, Jean R.; Coombes, Michael; Richard, Jean-Claude; and Hitchinson, Patrick W., 4,232,598, Cl. 99-483.000.

Blanc, Jean-Pierre; and Meiller, Francois, to Rhone-Poulenc Industries. Novel sand/silicate compositions for foundry molds/cores. 4,233,076, Cl. 106-38.350.

Blasing, Horst; and Gute, Manfred, to Schering Aktiengesellschaft. Device for the processing of pourable bulk material. 4,233,145, Cl. 204-202.000.

Blatt, Gerald. Arm elevator and sling. 4,232,664, Cl. 128-94.000.

Blatter, Albert: *See—*
Casey, Gary L.; Blatter, Albert; Miller, John A.; and Claxton, William B., 4,232,830, Cl. 239-585.000.

Blenman, Orman L. Electrical apparatus for testing voltage, polarity and continuity. 4,233,560, Cl. 324-133.000.

Bless, Franz: *See—*
Limque, Ferdinand; and Bless, Franz, 4,232,852, Cl. 266-80.000.

Blight, Graham J.: *See—*
Chou, Frank S. F.; Tuturea, David P.; and Blight, Graham J., 4,232,623, Cl. 114-125.000.

Blose, John B.: *See—*
Gilkeson, Robert F.; and Blose, John B., 4,233,590, Cl. 340-870.040.

Blythe, Anthony R., to Imperial Chemical Industries Limited. Apparatus and method for monitoring web conductivity. 4,233,562, Cl. 324-455.000.

Bodrero, Alberta. Conformable seatback cover. 4,232,898, Cl. 297-219.000.

Boehm, Hans W.; Herrington, Richard A.; and Oelke, Waldemar W., to Libbey-Owens-Ford Company. Apparatus for thermally severing glass. 4,232,809, Cl. 225-93.500.

Boehmke, Gunther, to Bayer Aktiengesellschaft. Cationic azo dyestuffs with a hydroxyalkylated ammonium group. 4,233,214, Cl. 260-158.000.

Boehringer Ingelheim GmbH: *See—*
Trummlitz, Gunter; Engel, Wolfhard; Seeger, Ernst; and Engelhardt, Gunther, 4,233,299, Cl. 424-246.000.
Trummlitz, Gunter; Seeger, Ernst; and Engel, Wolfhard, 4,233,333, Cl. 426-548.000.

Boeing Company, The: *See—*
Brown, Robert B., 4,232,515, Cl. 60-204.000.

Boger, Manfred; Drabek, Jozef; Mattern, Gunter; and Traber, Walter, to Ciba-Geigy Corporation. 1-Iminomethylene-substituted 2-(phenoxy-alkyl)-2-imidoazoline derivatives. 4,233,306, Cl. 424-263.000.

Bohm, Georg G. A.; and Barbin, William W., to Firestone Tire & Rubber Company, The. Apparatus for producing continuous cured rubber strips. 4,233,013, Cl. 425-174.400.

Bohner, Beat: *See—*
Szczepanski, Henry; Rohr, Otto; Pissiotas, Georg; Bohner, Beat; and Rempfler, Hermann, 4,233,054, Cl. 71-70.000.

Boldebuck, Edith M.; Banucci, Eugene G.; and Byrne, Martin A., to General Electric Company. Polyesterimide resins and synthesis thereof. 4,233,435, Cl. 528-350.000.

Bolender, Walter; and Wallner, Ernst, to ER-WE-PA Maschinenfabrik & Eisengiesserei. Rolls of controllable flexure, especially for machines for the production and processing of webs of paper or plastic. 4,233,011, Cl. 425-143.000.

Bolick, Fred C., Jr.; Titus, Theodore, IV; and Mohammadioun, Said, to Lanier Business Products, Inc. Cassette substitution apparatus. 4,233,638, Cl. 360-92.000.

Bolick, Virgil T., Jr., to Akzona Incorporated. Flat cable stripping and terminating technique. 4,232,444, Cl. 29-863.000.
Boliden Aktiebolag: *See*—
Allgulin, Torkel, 4,233,274, Cl. 423-210.000.
Bolton, Edgar A.; and Dallen, Larry D. Computer controlled registration and inquiry system. 4,233,661, Cl. 364-300.000.
Bondoc, Alfredo A.; Canfield, V. Robert; and Ziegler, B. Randall, to GAF Corporation. High-strength built-up roofing using improved glass fiber mats. 4,233,353, Cl. 428-141.000.
Boner, Beat; Rohr, Otto; Rempfler, Hermann; and Pissiotas, Georg, to Ciba-Geigy Corporation. α-Phenoxy-thiolpropionic acids. 4,233,060, Cl. 71-94.000.
Boot, Michael A.: *See*—
Prince, Luther T., Jr.; Hampel, Wilbur J.; and Boot, Michael A., 4,233,553, Cl. 320-23.000.
Borden, George W.; Smith, Oliver W.; and Trecker, David J., to Union Carbide Corporation. Ink and coating compositions and method. 4,233,130, Cl. 204-159.230.
Boret, Roger; Bronner, Charles; Huin, Roland; and Vidal, Andre, to Institut Francais du Petrole. Apparatus for hydrocarbon conversion. 4,233,268, Cl. 422-190.000.
Borg-Warner Corporation: *See*—
Lamarche, Paul E., 4,232,534, Cl. 64-27.00C.
Tuzson, John J., 4,232,770, Cl. 192-41.00R.
Borza, Michele: *See*—
Antonelli, Sergio; and Borza, Michele, 4,233,140, Cl. 208-180.000.
Bost, Charles, to Sentry Controls, Inc. Control system for environmental apparatus. 4,232,819, Cl. 236-47.000.
Botez, Dan; Ettenberg, Michael; and Kressel, Henry, to RCA Corporation. Light emitting diode. 4,233,614, Cl. 357-17.000.
Bottoms, Harry S.; and Heath, Ronald A., to Lucas Industries Limited. Hydraulic gear pump with recesses in non-working gear flanks. 4,233,005, Cl. 418-190.000.
Bourgeous, Clarence G.; and Miller, Oliver G., to Ford Motor Company. Counterweight assembly for a vehicle. 4,232,883, Cl. 280-759.000.
Bourguignon, Jean; Sion, Marcel-Xavier; and Moreau, Michel, to Societe Chimique de La Grande Paroisse, Azote et Produits Chimiques. Preparation of tris(hydroxymethyl)aminomethane. 4,233,245, Cl. 564-506.000.
Bouwhuis, Gijsbertus; and Hazerdonk, Teunis J., to U.S. Philips Corporation. Opto-electronic focussing error detection arrangement. 4,233,502, Cl. 250-204.000.
Bowen, Willard L., III, to Torrington Company, The. Hollow roller tapered bearing. 4,232,914, Cl. 308-215.000.
Bower, Terry F.; Randlett, M. Ronald; and Shinopulos, George, to Kennecott Copper Corporation. Method and apparatus for the continuous production of strip. 4,232,727, Cl. 164-76.000.
Bowman, John K.: *See*—
Becker, Bernard S.; Bowman, John K.; and Randall, Cyril A., 4,232,704, Cl. 137-218.000.
Boxrud, Phillip E. Equipment trailer. 4,232,879, Cl. 280-656.000.
Bracke, William J. I.: *See*—
Lingier, Willy F. R.; Lanza, Emmanuel; and Bracke, William J. I., 4,233,418, Cl. 525-243.000.
Bradley Corporation: *See*—
Williams, Frank N., 4,232,407, Cl. 4-287.000.
Bradshaw, John: *See*—
Martin-Smith, Michael; Price, Barry J.; Bradshaw, John; and Clitherow, John W., 4,233,302, Cl. 424-251.000.
Brady, Jesse J., III, to United States of America, Navy. Serial phase shift beamformer using charge transfer devices. 4,233,678, Cl. 367-122.000.
Brady, Thomas E.; and Go, Santos W., to Owens-Illinois, Inc. Apparatus for forming heat treated blown thermoplastic articles. 4,233,022, Cl. 425-525.000.
Braid, John E.: *See*—
Cubbon, Robert C. P.; Braid, John E.; Oates, Alfred E.; and Preston, Ronald, 4,233,462, Cl. 568-564.000.
Braitinger, Helmut: *See*—
Schneider, Franz; Braitinger, Helmut; Bergmann, Ewald; and Kurz, Otto, 4,232,575, Cl. 83-71.000.
Brasch, William, to LeaRonal, Inc. Method of improving the adhesion of electroless metal deposits employing colloidal copper activator. 4,233,344, Cl. 427-304.000.
Bratchenko, Anatoly P.: *See*—
Shalai, Alexandr N.; Nikitin, Mikhail D.; Zakharov, Nikolai I.; and Bratchenko, Anatoly P., 4,233,490, Cl. 219-121.00P.
Braukmann Armaturen AG: *See*—
Braukmann, Bernhard W.; and Vollmer, Rudolf, 4,232,817, Cl. 236-42.000.
Braukmann, Bernhard W.; and Vollmer, Rudolf, to Braukmann Armaturen AG. Adjustment control for a thermostatic valve. 4,232,817, Cl. 236-42.000.
Bravin, Ben, to Dynamex Corporation. Positive self-orienting traverse apparatus in wire take-up machine. 4,232,838, Cl. 242-158.00R.
Brearley, Malcolm, to Girling Limited. Malfunction detector for speed sensors. 4,233,599, Cl. 340-679.000.
Breault, Richard D.; Roethlein, Richard J.; and Congdon, Joseph V., to United Technologies Corporation. Fuel cell cooler assembly and edge seal means therefor. 4,233,369, Cl. 429-26.000.
Breault, Richard D.: *See*—
Goller, Glen J.; and Breault, Richard D., 4,233,181, Cl. 252-425.300.
Breguet, Jean-Luc: *See*—
Besson, Rene; and Breguet, Jean-Luc, 4,232,464, Cl. 40-451.000.
Breig, Kurt; Dehmel, Georg; and Hamm, Norbert, to Bayer Aktiengesellschaft. Process for the continuous indirect diazotization of aromatic amines. 4,233,213, Cl. 260-141.000.
Bressani, Raymond. Base for poles. 4,232,846, Cl. 248-158.000.
Briggs & Stratton Corporation: *See*—
Catterson, Robert K., 4,233,043, Cl. 55-315.000.
Tharman, Paul A., 4,233,534, Cl. 310-71.000.
Bright, John H.; and Schmitt, Joseph L., Jr., to American Cyanamid Company. Process for preparing N,N-dimethylaminobenzoic acids. 4,233,458, Cl. 562-458.000.
Brissey, George E.; and Gathers, Glen E., to General Electric Company. Electromagnetically controlled, resettable high-speed shaft disconnect. 4,232,772, Cl. 192-114.00R.
Bristol Myers Co.: *See*—
Nitshke, Norman L., 4,232,669, Cl. 128-218.00N.
British Petroleum Company Limited, The: *See*—
Myers, Philip A.; and Westlake, David J., 4,233,438, Cl. 536-1.000.
Bro, Per; and Wallis, George, to P. R. Mallory & Co. Inc. Hermetic seal for electrochemical cell. 4,233,372, Cl. 429-174.000.
Bronner, Charles: *See*—
Boret, Roger; Bronner, Charles; Huin, Roland; and Vidal, Andre, 4,233,268, Cl. 422-190.000.
Bronnvall, Wolfgang A.: *See*—
Sundin, Anders O.; and Bronnvall, Wolfgang A., 4,233,066, Cl. 75-142.000.
Broughton, Donald R.: *See*—
Russ, Karl J.; and Broughton, Donald R., 4,233,179, Cl. 252-373.000.
Broughton, Michael, to Farrow Irrigation Limited. Liquid sludge disposal. 4,232,826, Cl. 239-112.000.
Brown, Boveri & Cie Aktiengesellschaft: *See*—
Rohr, Franz-Josef; and Holick, Hubert, 4,233,142, Cl. 204-195.00S.
Brown, Donald J., to Knox Manufacturing Co. Abrading device. 4,232,487, Cl. 51-425.000.
Brown, Douglas P. Throwing sling. 4,232,648, Cl. 124-5.000.
Brown, Earl J.; and Sie, Swan A., to Chevron Research Company. Automatic system and method for testing marine streamers of seismic exploration systems. 4,233,677, Cl. 367-13.000.
Brown, Frank H., to Automecha Ltd. Paper feeder. 4,232,860, Cl. 271-119.000.
Brown, Melvin H., to Aluminum Company of America. Coal burning method to reduce particulate and sulfur emissions. 4,232,615, Cl. 110-342.000.
Brown, Mortimer, to Nightingale Industries Limited. Modular partition. 4,232,724, Cl. 160-135.000.
Brown, Robert B., to Boeing Company, The. Supersonic cruise airplane and engine. 4,232,515, Cl. 60-204.000.
Brown & Root, Inc.: *See*—
Chou, Frank S. F.; Tuturea, David P.; and Blight, Graham J., 4,232,623, Cl. 114-125.000.
Brown, William E., to Kaiser Aluminum & Chemical Corporation. Refractory composition for forming a monolithic structure. 4,233,078, Cl. 106-56.000.
Bruce, Arthur P.: *See*—
Hammel, Richard L.; Schaefer, Robert H.; Lancia, Frederick N.; Wolfe, William A.; Dearth, Leonard F.; Benton, Stephen L.; Homan, H. Richard; and Bruce, Arthur P., 4,232,798, Cl. 221-12.000.
Brunaud, Daniel, to Framatome. Removal of residual stresses in a tube seated in a tube plate. 4,232,442, Cl. 29-727.000.
Bschorr, Oskar, to Messerschmitt-Bolkow-Blohm GmbH. Wide-band vibration damper. 4,232,762, Cl. 188-1.00B.
BSL Corporation: *See*—
Gidge, Kenneth, 4,232,725, Cl. 160-332.000.
Bucalo, Louis. Method for collecting and processing body fluids. 4,232,673, Cl. 128-769.000.
Buchel, Karl H.: *See*—
Kramer, Wolfgang; Buchel, Karl H.; Plempel, Manfred; and Haller, Ingo, 4,233,311, Cl. 424-273.00R.
Buchmann, Hans, to Zuhlke Engineering AG. Apparatus for moving toll bars or the like. 4,232,484, Cl. 49-334.000.
Budyak, Robert J.: *See*—
Burris, Robert E.; and Budyak, Robert J., 4,232,696, Cl. 137-62.000.
Buehler-Miag GmbH: *See*—
Hatje, Erich; and Reinert, Norbert, 4,232,734, Cl. 165-118.000.
Buffalo Brake Beam Company: *See*—
Becht, George L.; Melachowski, Jerome A.; and Wolicki, Richard J., 4,232,760, Cl. 182-194.000.
Bugaut, Andree: *See*—
Kalopissis, Gregoire; Bugaut, Andree; and Estradier, Francoise, 4,233,241, Cl. 564-221.000.
Bukaitz, Finley M., to Kero Metal Products Co., Inc. Prefabricated metal drawer file cabinets or similar articles. 4,232,920, Cl. 312-257.00R.
Bulkley, Charles W., to Monsanto Company. Polymeric blend. 4,233,409, Cl. 525-71.000.
Bumgarner, John C., Sr. Swimming pool deck. 4,232,491, Cl. 52-169.700.
Bunker Ramo Corporation: *See*—
Inouye, Hiromasa; Kato, Matsuo; and Ito, Hiroaki, 4,232,926, Cl. 339-45.00M.
Otsuki, Tomonari; and Inouye, Hiromasa, 4,232,923, Cl. 339-17.0LC.
Stahl, John M.; and DeRoss, Robert W., 4,233,478, Cl. 200-51.090.

Burdett, Kenneth A.: *See—*
Tefertiller, Nancy B.; Burdett, Kenneth A.; and Harris, Robert F., 4,233,425, Cl. 525-455.000.

Burdick, Edward J., to National Semiconductor Corporation. Multi-function logic circuit. 4,233,524, Cl. 307-205.000.

Burgess Power Tools Limited: *See—*
Craddock, Peter J.; Law, Brian R.; and Smith, Albert J., 4,232,579, Cl. 83-788.000.

Burgin, Charles W., to Morton Machine Works, Incorporated. Process for wetting fiber. 4,232,416, Cl. 8-156.000.

Burke, Noel I., to Tee-Pak, Inc. Concentrated acid swelling of collagen in preparation of edible collagen casing. 4,233,329, Cl. 426-277.000.

Burns, Richard C.: *See—*
Menson, Robert C.; Narayanswamy, Venkatachalam; and Burns, Richard C., 4,233,403, Cl. 435-22.000.

Burough, Irvin G.: *See—*
Elder, William L.; Williams, Kevin G.; and Burough, Irvin G., 4,233,513, Cl. 250-343.000.

Burres, John S. Gang plow hitch. 4,232,876, Cl. 280-412.000.

Burris, Robert E.; and Budyak, Robert J., to Prime Manufacturing Corporation. Drain valve assembly. 4,232,696, Cl. 137-62.000.

Burtis, Kathryn S. Transformable christening bonnet and bride's handkerchief. 4,232,403, Cl. 2-204.000.

Burton, Frank, to Beloit Corporation. Dryer drum condensate removal apparatus. 4,232,455, Cl. 34-124.000.

Buschmann, Gerhard, to Jagenberg-Werke Aktiengesellschaft. Apparatus for pulsewise dispensation of very small amounts of liquid, particularly H_2O_2. 4,232,802, Cl. 222-56.000.

Butcher, John A. W.; and Salino, Michael A., to Standard Telephones and Cables Limited. Automatic telecommunication exchange system. 4,233,471, Cl. 178-69.00G.

Butler, Donald J.: *See—*
Rogers, James H.; and Butler, Donald J., 4,233,600, Cl. 340-683.000.

Butz, David E.: *See—*
Kaplow, Roy; Butz, David E.; and Stenfors, Alan L., 4,233,586, Cl. 335-303.000.

Byrne, Martin A.: *See—*
Boldebuck, Edith M.; Banucci, Eugene G.; and Byrne, Martin A., 4,233,435, Cl. 528-350.000.

C.M.L. Costruzioni Meccaniche Liri S.r.l.: *See—*
Caporusso, Alessandro; and Caporusso, Mario, 4,232,542, Cl. 72-389.000.

C. Reichert Optische Werke, AG: *See—*
Edelmann, Ludwig, 4,232,453, Cl. 34-92.000.

Cabinplant A/S: *See—*
Andersen, Niels J., 4,232,503, Cl. 53-517.000.

Cain, Clifford W., Jr.: *See—*
Gross, Stephen E.; Cain, Clifford W., Jr.; Bilawsky, Paul D.; and Scheffel, Norman B., 4,233,379, Cl. 429-247.000.

Cain, Jack C.; and Carlson, Maynard E. Controlled variable radius roll forming apparatus. 4,232,540, Cl. 72-11.000.

Caldwell, Lloyd, to Caldwell, Lloyd. Portable and collapsible seat. 4,232,896, Cl. 297-4.000.

Caldwell, Walter C., to Sun Oil Company (Delaware). Self-aligning-axial shafts-magnetic coupling. 4,232,535, Cl. 64-28.00M.

California Institute of Technology: *See—*
Perkins, Gerald S., 4,232,562, Cl. 74-424.80R.

Calspan Corporation: *See—*
Baier, Robert E., 4,233,404, Cl. 435-30.000.

Camden, James B.; and McCarty, Mark L., to Procter & Gamble Company, The. Method for making diperoxyacids. 4,233,235, Cl. 260-502.00R.

Cameron, Robert G.: *See—*
Fernandez, Jose M.; Cameron, Robert G.; and Walsh, Edward J., 4,233,389, Cl. 430-140.000.

Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence: *See—*
Atkinson, James T. N.; and Sahoo, Maheswar, 4,233,376, Cl. 429-199.000.
Clark, Michael N.; and Smith, Donald L., 4,232,843, Cl. 244-3.290.

Canfield, Sheldon A., to Owens-Corning Fiberglas Corporation. Electro optical control to detect a filament passing through a guide eye and using a light emitting diode. 4,233,520, Cl. 250-561.000.

Canfield, V. Robert: *See—*
Bondoc, Alfredo A.; Canfield, V. Robert; and Ziegler, B. Randall, 4,233,353, Cl. 428-141.000.

Canon Kabushiki Kaisha: *See—*
Fukahori, Hidehiko; Iwashita, Tomonori; and Mashimo, Yukio, 4,232,958, Cl. 354-212.000.
Hirayama, Kazuhiro; Sato, Yasushi; Tokiwa, Taisuke; Kawakubo, Kazuo; Iwatate, Fujio; and Nakatsui, Hisashi, 4,233,612, Cl. 346-160.000.
Ikemori, Keiji, 4,232,942, Cl. 350-184.000.
Kitamura, Takashi; Watanabe, Asao; Nakano, Takashi; Masaki, Katsumi; Hirayama, Kazuhiro; Sato, Yasushi; and Tokiwa, Taisuke, 4,232,954, Cl. 354-7.000.
Masuda, Takeshi, 4,232,961, Cl. 355-14.00R.

Caporusso, Alessandro; and Caporusso, Mario, to C.M.L. Costruzioni Meccaniche Liri S.r.l. Portable manually controlled pipe-bending apparatus provided with reversible bending members. 4,232,542, Cl. 72-389.000.

Caporusso, Mario: *See—*
Caporusso, Alessandro; and Caporusso, Mario, 4,232,542, Cl. 72-389.000.

Carborundum Company, The: *See—*
Ohnsorg, Roger W., 4,233,256, Cl. 264-44.000.

Carl Still, Firma: *See—*
Lemke, Otto; and Krause, Manfred, 4,232,566, Cl. 74-569.000.

Carlin, Joseph T.: *See—*
Tyler, Timothy N.; and Carlin, Joseph T., 4,232,737, Cl. 166-273.000.

Carlson, Eric R.; Schneider, Martin V.; and Trambarulo, Ralph F., to Bell Telephone Laboratories, Incorporated. Technique for suppressing spurious resonances in strip transmission line circuits. 4,233,579, Cl. 333-204.000.

Carlson, Maynard E.: *See—*
Cain, Jack C.; and Carlson, Maynard E., 4,232,540, Cl. 72-11.000.

Carlson Stapler and Shippers Supply, Inc.: *See—*
Russell, B. Carson, 4,232,810, Cl. 227-19.000.

Carlsson, Kaj, to Konetehdas Maskinfabrik NORCAR Ky Kb. Endless track vehicle. 4,232,753, Cl. 180-9.20R.

Carney, Leroy L., to Halliburton Company. Oil well fluids and dispersants. 4,233,162, Cl. 252-8.50C.

Carnine, Daniel K.: *See—*
Babbitt, Frederick J.; and Carnine, Daniel K., 4,232,529, Cl. 62-160.000.

Carr, Donald L.: *See—*
Carr, Randall; Geoffroy, L. E.; Flagg, Rodger H.; and Carr, Donald L., 4,233,132, Cl. 204-169.000.

Carr, Randall; Geoffroy, L. E.; Flagg, Rodger H.; and Carr, Donald L. Method and apparatus for producing hydrogen. 4,233,132, Cl. 204-169.000.

Casey, Gary L.; Blatter, Albert; Miller, John A.; and Claxton, William B., to Bendix Corporation, The. Electromagnetic fuel injector. 4,232,830, Cl. 239-585.000.

Cassera, James A.: *See—*
Perrine, Paul M.; and Cassera, James A., 4,232,597, Cl. 99-468.000.

Castleberry, Donald E., to General Electric Company. Multiplexed varistor-controlled liquid crystal display. 4,233,603, Cl. 340-783.000.

Caterpillar Tractor Co.: *See—*
Corrigan, Ara L.; Styck, Wayne G.; and Walden, Gerald M., 4,232,754, Cl. 180-9.500.

Catterson, Robert K., to Briggs & Stratton Corporation. Air cleaner for internal combustion engine. 4,233,043, Cl. 55-315.000.

Cavar, Gustav: *See—*
Cricchi, James R.; and Cavar, Gustav, 4,233,673, Cl. 365-184.000.

CBS Inc.: *See—*
Mahler, Henry W., 4,233,631, Cl. 358-182.000.

Celi, Antonio M., to Wiegand, Karl W. Safety close-off valve arrangement for pipe conduit systems and installations. 4,232,703, Cl. 137-172.000.

Cemel, Albert; Chaban, Castulo, Jr.; and Fresco, Albert Z., to Du Pont de Nemours, E. I., and Company. Polyester draw-texturing feed yarns. 4,233,363, Cl. 428-373.000.

Cementa AB: *See—*
Sandahl, Evert G. I., 4,232,984, Cl. 405-261.000.

Ceskoslovenska akademie ved: *See—*
Barta, Cestmir; Ctyroky, Jiri; Silvestrova, Iraida M.; and Pisarevskij, Jurij V., 4,232,952, Cl. 350-358.000.

Chaban, Castulo, Jr.: *See—*
Cemel, Albert; Chaban, Castulo, Jr.; and Fresco, Albert Z., 4,233,363, Cl. 428-373.000.

Chakrabarti, Paritosh M., to GAF Corporation. Preparation of salt-free N-acyl taurines. 4,233,229, Cl. 260-401.000.

Chalon, Jack; Ramanathan, Sivam; and Turndorf, Herman. Single limb breathing circuit assembly and absorber. 4,232,667, Cl. 128-203.260.

Chambert, Lars A. A. Process and reactor for conducting exothermal reactions in a circulating fluidized bed. 4,232,633, Cl. 122-4.00D.

Chamoulaud, Michel C. Carpet of vegetable matter. 4,232,481, Cl. 47-56.000.

Champion International Corporation: *See—*
Cottrell, Edward D.; and Robbins, Michael B., 4,232,811, Cl. 227-117.000.
Gingerich, David L., 4,232,592, Cl. 493-10.000.

Chapin, Paul D. Combination breech-loading to muzzle-loading firearm converting device and projectile casing. 4,232,468, Cl. 42-77.000.

Chapman, Ronald H.; and Hansen, Kenneth A., to Motorola, Inc. Wide frequency range current-controlled oscillator. 4,233,575, Cl. 331-111.000.

Charbonnages de France: *See—*
Valantin, Alfred A. M., 4,232,911, Cl. 305-16.000.

Chattha, Mohinder S., to Ford Motor Company. Coating composition catalyzed with phosphonic acid derivative-2. 4,233,415, Cl. 525-161.000.

Chemcut Corporation: *See—*
Goffredo, Daniel L., 4,233,106, Cl. 156-627.000.

Chemische Werke Huels Aktiengesellschaft: *See—*
Berger, Dieter; Bartz, Wilfried; and Seeliger, Wolfgang, 4,233,202, Cl. 260-348.360.
Kalka, Josef; Hentschel, Bernhard; and Ziebarth, Jurgen, 4,233,437, Cl. 528-500.000.

Chen, Lim B.; and Cher, Lim L., to Cybiotronics Limited. Radiation sensing mobile target game. 4,232,865, Cl. 273-311.000.

Chen, Sow-Mei L.: *See—*
Floyd, Middleton B., Jr.; Grudzinskas, Charles V.; and Chen, Sow-Mei L., 4,233,231, Cl. 260-429.700.

Chen-Yuan, Lee. Two variable flush gate for lavatory reservoir. 4,232,408, Cl. 4-325.000.

Cher, Lim L.: *See—*
Chen, Lim B.; and Cher, Lim L., 4,232,865, Cl. 273-311.000.

Chernoch, Joseph P., to General Electric Company. Face-cooled laser device having increased energy storage and output. 4,233,567, Cl. 331-94.50P.

Chernoff, Ralph C.: *See—*
United States of America, National Aeronautics and Space Administration; and Chernoff, Ralph C., 4,233,606, Cl. 343-100.0TD.

Chervitz, Melvin. Fever thermometer. 4,232,684, Cl. 128-736.000.

Chesler, Ronald B.: *See—*
Dabby, Franklin W.; and Chesler, Ronald B., 4,232,938, Cl. 350-96.200.

Chevron Research Company: *See—*
Brown, Earl J.; and Sie, Swan A., 4,233,677, Cl. 367-13.000.
Lewis, Robert A.; and Honnen, Lewis R., 4,233,168, Cl. 252-51.50A.
Pyle, Walter R., 4,232,715, Cl. 141-1.000.
Simic, Milutin, 4,233,082, Cl. 106-287.230.

Chiba, Takehisa: *See—*
Fujita, Tadashi; Oya, Masayuki; Watanabe, Toshio; and Chiba, Takehisa, 4,233,310, Cl. 424-273.00R.

Chicago Fire Brick Company: *See—*
Rechter, Harold L., 4,233,079, Cl. 106-56.000.

Chin, Joseph T.; Hochhauser, Arthur M.; and McCarthy, John P., to DCA Food Industries, Inc. Food product forming apparatus. 4,233,016, Cl. 425-288.000.

Chinfen, Dennis L. Egg roll extrusion and handling apparatus. 4,233,018, Cl. 425-297.000.

Chinoin Gyogyszer es Vegyeszeti Termekek Gyara R.T.: *See—*
Szebenyi nee Gyori, Eniko; Kovacs nee Mindler, Vera; Redey, Laszlo; and Szemos nee Szonyi, Agnes, 4,233,121, Cl. 204-59.00R.

Chiyoda Chemical Engineering & Construction Co., Ltd.: *See—*
Ozaki, Kiyoji; Fukuhara, Akinobu; Hosoi, Takuji; and Sagi, Yasuo, 4,233,137, Cl. 208-48.00Q.

Chloride Group Limited: *See—*
McWhinnie, John; and Dawson, John L., 4,233,070, Cl. 75-167.000.

Chloride, Incorporated: *See—*
Kalns, Rudolph W., 4,233,504, Cl. 250-214.0RC.

Chmura, Stanley J., to Motorola, Inc. Method and apparatus for a PSK signal detector. 4,233,565, Cl. 329-50.000.

Chmura, William J., to Textron Inc. Powder metallurgy production of spherical articles, such as bearing elements. 4,232,436, Cl. 29-148.40B.

Chopra, Gopal M.: *See—*
Ghosh, Bidhan C.; Chopra, Gopal M.; and Sen, Soumendra N., 4,233,095, Cl. 149-95.000.

Chou, Feng-Te: *See—*
Driscoll, John S.; Khan, A. Hameed; and Chou, Feng-Te, 4,233,215, Cl. 260-239.0EQ.

Chou, Frank S. F.; Tuturea, David P.; and Blight, Graham J., to Brown & Root, Inc. Apparatus to reduce vessel motions. 4,232,623, Cl. 114-125.000.

Chow, Pel. Process for the manufacture of PNP transistors high power. 4,233,093, Cl. 148-189.000.

Christensen, Earl A. Body massage apparatus. 4,232,661, Cl. 128-33.000.

Christiansen, Jorn U., to Tour & Andersson Aktiebolag. Control unit for starting a climitization procedure in a building. 4,232,818, Cl. 236-46.00R.

Christoph Emmerich KG: *See—*
Landkammer, Franz J., 4,233,595, Cl. 340-542.000.

Chronis, George C. Portion control dressing and food dispenser. 4,232,801, Cl. 222-43.000.

Chugai Denki Kogyo Kabushiki-Kaisha: *See—*
Shibata, Akira, 4,232,812, Cl. 228-3.100.

Chutter, Raymond A., to Procter & Gamble Company, The. Package for antiperspirant/deodorant. 4,232,977, Cl. 401-68.000.

Ciba-Geigy Aktiengesellschaft: *See—*
Dodwell, Geoffrey M.; and Gambles, Norman E., 4,233,074, Cl. 430-535.000.
Kitzing, Rainer; Scott, John G. V.; Webb, Terence C.; and Evans, Graham, 4,233,399, Cl. 430-510.000.

Ciba-Geigy Corporation: *See—*
Boger, Manfred; Drabek, Jozef; Mattern, Gunter; and Traber, Walter, 4,233,306, Cl. 424-263.000.
Boner, Beat; Rohr, Otto; Rempfler, Hermann; and Pissiotas, Georg, 4,233,060, Cl. 71-94.000.
Dexter, Martin; and Steinberg, David H., 4,233,209, Cl. 260-45.85E.
Koller, Josef; Horn, Ulrich; Moser, Peter; Motter, Manfred; and Galafassi, Pierre, 4,233,028, Cl. 8-534.000.
Kunz, Walter; Eckhardt, Wolfgang; and Hubele, Adolf, 4,233,308, Cl. 424-279.000.
Kvita, Vratislav; Darms, Roland; and Greber, Gerd, 4,233,220, Cl. 260-326.260.
Maier, Ludwig, 4,233,056, Cl. 71-86.000.
Martin, Henry, 4,233,055, Cl. 71-76.000.
Rody, Jean; and Rasberger, Michael, 4,233,410, Cl. 525-123.000.
Rody, Jean; and Rasberger, Michael, 4,233,412, Cl. 525-167.000.
Spivack, John D., 4,233,207, Cl. 260-45.70P.
Spivack, John D., 4,233,208, Cl. 260-45.8NT.
Szczepanski, Henry; Rohr, Otto; Pissiotas, Georg; Bohner, Beat; and Rempfler, Hermann, 4,233,054, Cl. 71-70.000.

Ciciora, Walter S., to Zenith Radio Corporation. NTSC receiver useable with Teletext/Viewdata information. 4,233,628, Cl. 358-147.000.

Cipriani, Renzo. Safety device for mechanical eccentric cam presses. 4,232,773, Cl. 192-131.00R.

Citizen Watch Co., Ltd.: *See—*
Tamaru, Munetaka; Tsuzuki, Akira; Morokawa, Shigeru; Watanabe, Minoru; Kume, Kazunari; and Oono, Hideshi, 4,232,510, Cl. 368-28.000.
Yoshikawa, Kenichi; Koshikawa, Makoto; Umemoto, Toshio; Satoh, Tetsuo; Ichikawa, Singo; and Kato, Yoshiaki, 4,232,512, Cl. 368-82.000.

Claber S.p.A.: *See—*
Roman, Gian F., 4,232,827, Cl. 239-242.000.

Clairol Incorporated: *See—*
Springer, William E., 4,232,454, Cl. 34-97.000.

Clarion Co., Ltd.: *See—*
Mikoshiba, Nobuo; and Minagawa, Shoichi, 4,233,530, Cl. 307-424.000.

Clark, Michael N.; and Smith, Donald L., to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Molded nozzle for rocket motor. 4,232,843, Cl. 244-3.290.

Clarke, Robert L.; and Daum, Sol J., to Sterling Drug Inc. 3-Methoxycarbonyl-2-(2-thienyl)-8-azabicyclo[3.2.1]octane-8-acetamide and salts thereof. 4,233,448, Cl. 546-125.000.

Clarke, Robert L. G.; and Daum, Sol J., to Sterling Drug Inc. 1-(8-Methyl-2-phenyl(or thienyl)-8-azabicyclo[3.2.1]octan-3-yl) ethanone. 4,233,449, Cl. 546-125.000.

Claxton, William B.: *See—*
Casey, Gary L.; Blatter, Albert; Miller, John A.; and Claxton, William B., 4,232,830, Cl. 239-585.000.

Clayborne, William J.: *See—*
Hauser, Hans; and Clayborne, William J., 4,232,569, Cl. 74-701.000.

Clemead Limited: *See—*
Jones, Norman; and Dawson, Peter, 4,233,358, Cl. 428-246.000.

Clement, Ralph C.: *See—*
DiMarco, Bernard; Clement, Ralph C.; and Parmenter, Charles W., 4,233,482, Cl. 200-163.000.

Clitherow, John W.: *See—*
Martin-Smith, Michael; Price, Barry J.; Bradshaw, John; and Clitherow, John W., 4,233,302, Cl. 424-251.000.

Clokie, Andrew K., to Greenbat, Limited. Traveling yarn dispensers. 4,232,714, Cl. 139-371.000.

Coad, George L., to Varian Associates, Inc. Radiation therapy apparatus having retractable beam stopper. 4,233,519, Cl. 250-514.000.

Coal Industry (Patents) Limited: *See—*
Taylor, Rodney; Pragnell, Robert J.; and Sheppard, John P., 4,233,357, Cl. 428-245.000.

Cobb, Raymond L., to Phillips Petroleum Company. Pyrolysis of N-substituted-1-cyclohexene-1,2-dicarboximides. 4,233,218, Cl. 260-326.00C.

Codman and Shurtleff, Inc.: *See—*
Dale, William A., 4,232,659, Cl. 128-1.00R.

Cohen, Murray, to Grumman Aerospace Corporation. Double locking device. 4,232,978, Cl. 403-317.000.

Coker, Robert J.; Bate, Gary W.; and Deuzeman, Henk J., to Fiberglas Canada Limited. Combined batch reactor system and continuous distillation apparatus. 4,233,267, Cl. 422-187.000.

Cole, Allan, to E M I Limited. Moving transducer systems. 4,232,556, Cl. 73-626.000.

Coleman, John R., to Northrop Corporation. Helicopter radar decoy. 4,233,605, Cl. 343-18.00D.

Coleman, William E., to NCR Corporation. Input-keep alive arrangement for plasma charge transfer device. 4,233,544, Cl. 315-169.200.

Coles, Robert L. Winged irrigating surgical retractor. 4,232,660, Cl. 128-20.000.

Collagen Corporation: *See—*
Luck, Edward E.; and Daniels, John R., 4,233,360, Cl. 428-310.000.

Collier-Keyworth Company: *See—*
Parker, James A., 4,232,900, Cl. 297-305.000.

Columbus, Richard L., to Eastman Kodak Company. Liquid transport device and method. 4,233,029, Cl. 23-230.00R.

Combustion Engineering, Inc.: *See—*
Auyeung, Sean; and Etzel, William W., 4,233,518, Cl. 250-507.000.
Prohazka, George J., 4,232,636, Cl. 122-479.00R.

Commissariat a l'Energie Atomique: *See—*
Jacquelin, Roland, 4,233,115, Cl. 176-36.00C.

Comperatore, John A.; Wise, David J.; and Black, Edward D., to PPG Industries, Inc. Shaping glass sheets by gravity sag bending followed by blow forming. 4,233,050, Cl. 65-107.000.

Compo Industries, Inc.: *See—*
Willwerth, Charles M.; and Silvia, John P., 4,233,012, Cl. 425-162.000.

Congdon, Joseph V.: *See—*
Breault, Richard D.; Roethlein, Richard J.; and Congdon, Joseph V., 4,233,369, Cl. 429-26.000.

Conner, Alvin J., Sr. Non-petroleum based metal corrosion inhibitor. 4,233,176, Cl. 252-392.000.

Conservation Technologies, Inc.: *See—*
Terrell, George C.; and Konnerth, Andrew, III, 4,232,634, Cl. 122-41.000.

Container Corporation of America: *See—*
Johnson, Fred J.; and Bell, Richard L., 4,232,816, Cl. 229-33.000.
Karpinsky, William J., 4,232,591, Cl. 493-314.000.

Continental Group, Inc., The: *See—*
Allgaier, Joseph M.; Richens, Jack W.; and Leekha, Rajendra K., 4,232,717, Cl. 141-179.000.
Weierman, Robert J.; Merle, Joseph J.; Gordon, Gerald A.; Pan, Peter N. Y.; and Hernandez, Rafael J., 4,232,622, Cl. 113-121.00C.

Continental Gummi-Werke Aktiengesellschaft: *See*—
Pietratus, Udo; and Rothemeyer, Fritz, 4,233,259, Cl. 264-167.000.
Conwed Corporation: *See*—
Videen, Otis R., 4,232,480, Cl. 47-9.000.
Conzelmann, Gerhard: *See*—
Nagel, Karl; and Conzelmann, Gerhard, 4,233,556, Cl. 322-28.000.
Cook, Sidney F.; and Stolowitz, Mark, to Cook, Sidney F.; and Stolowitz, Mark L. Offshore submarine storage facility for highly chilled liquified gases. 4,232,983, Cl. 405-210.000.
Cooke, Brian A., to Imperial Chemical Industries Limited. Phosphate coating process. 4,233,087, Cl. 148-6.15Z.
Cooke, Claude E., Jr.: *See*—
Salathiel, William M.; Muecke, Thomas W.; Cooke, Claude E., Jr.; and Li, Norman N., 4,233,165, Cl. 252-8.55R.
Coombes, Michael: *See*—
Hurlow, Gerald S.; Blain, Jean R.; Coombes, Michael; Richard, Jean-Claude; and Hitchinson, Patrick W., 4,232,598, Cl. 99-483.000.
Cooper, Carl W. Concrete screed or form support. 4,232,847, Cl. 248-218.400.
Cooper Industries, Inc.: *See*—
Curtiss, George R., 4,232,414, Cl. 51-134.50F.
Copolymer Rubber & Chemical Corp.: *See*—
Karg, Rudolph F., 4,233,365, Cl. 428-404.000.
Cordill, Leroy D., to Phillips Petroleum Company. Method and apparatus for providing a digital output in response to an analog input and for providing an analog output in response to a digital input. 4,233,500, Cl. 235-310.000.
Cornell, John A. Gum emulsified liquid package for delivering and preserving liquid content in the mouth. 4,233,288, Cl. 424-48.000.
Corning Glass Works: *See*—
Beall, George H.; Mansfield, Gerald R.; and Schreurs, Jan W. H., 4,233,169, Cl. 252-62.590.
Dominick, Ellen K.; and Scherer, George W., 4,233,052, Cl. 65-144.000.
Herczog, Andrew, 4,232,676, Cl. 128-303.140.
Sarkar, Arnab, 4,233,045, Cl. 65-3.00A.
Correia, Daniel. Demountable and stackable multipurpose container. 4,232,916, Cl. 312-107.000.
Corrigan, Ara L.; Styck, Wayne G.; and Walden, Gerald M., to Caterpillar Tractor Co. Equalizer bar pad construction. 4,232,754, Cl. 180-9.500.
Corry, Nigel A. Imitation coal and method of making same. 4,233,348, Cl. 428-15.000.
Corvington, Edward J.; and Sitter, Elmer J., to Royal Mark Laminates. Skeletal frame structure with sheet material cover. 4,232,489, Cl. 52-63.000.
Cosden Technology, Inc.: *See*—
Lingier, Willy F. R.; Lanza, Emmanuel; and Bracke, William J. I., 4,233,418, Cl. 525-243.000.
Cottrell, Edward D.; and Robbins, Michael B., to Champion International Corporation. Apparatus for dispensing and inserting sticks. 4,232,811, Cl. 227-117.000.
Cowdery, James R.: *See*—
Khoylian, Rouzas R.; Cowdery, James R.; and Park, David B., 4,232,779, Cl. 198-472.000.
Cox, Bruce M., to Halliburton Company. Variable ratio intensifier. 4,233,000, Cl. 417-402.000.
Cox, Norman D., to Jefco Laboratories, Incorporated. Exhaust system for smokestack. 4,232,595, Cl. 98-59.000.
Crabbe, Rene: *See*—
Giacopelli, Umberto; Grassi, Bruno; and Crabbe, Rene, 4,233,147, Cl. 204-266.000.
Craddock, Peter J.; Law, Brian R.; and Smith, Albert J., to Burgess Power Tools Limited. Switch actuating assembly for power tools. 4,232,579, Cl. 83-788.000.
Cragoe, Edward J., Jr.: *See*—
Williams, Haydn W. R.; Cragoe, Edward J., Jr.; and Rooney, Clarence S., 4,233,452, Cl. 549-79.000.
Cramer, Rudy R.: *See*—
Kemner, Rudolf; and Cramer, Rudy R., 4,233,633, Cl. 358-221.000.
Crandall, Richard: *See*—
Leibowitz, Marshall; Crandall, Richard; and Faughnan, Brian, 4,233,339, Cl. 427-108.000.
Crawford, Larry B. Phonograph record album index tabs. 4,232,461, Cl. 40-23.00A.
Crawford, Wheeler C.: *See*—
Patterson, John A.; Crawford, Wheeler C.; and Wilson, James R., 4,233,244, Cl. 564-423.000.
Crescentini, Lamberto: *See*—
Balint, Laszlo J.; Crescentini, Lamberto; Fisher, William B.; and Sahli, Muhammad S., 4,233,279, Cl. 423-385.000.
Cricchi, James R.; and Cavar, Gustav, to Westinghouse Electric Corp. Electrically resettable non-volatile memory for a fuse system. 4,233,673, Cl. 365-184.000.
Crinos Industria Farmacobiologica S.p.A.: *See*—
Reiner, Alberto, 4,233,304, Cl. 424-256.000.
Croes, Nicolaus; Horler, Hansulrich; and Kirchhofer, Hubert, to BBC Brown, Boveri & Company, Limited. Superchargers for internal combustion engines. 4,232,999, Cl. 417-64.000.
Crosas, Pedro B. Electromechanical anti-theft system for automobile vehicle. 4,232,758, Cl. 180-287.000.
Crosby, Stephen R.: *See*—
Stellinger, Thomas S.; and Crosby, Stephen R., 4,232,578, Cl. 83-661.000.
Cross, Stephen D., to FMC Corporation. Confection conveyor. 4,232,780, Cl. 198-479.000.
Crump, Charles L. Safety eyewash package and container therefor. 4,232,671, Cl. 128-249.000.
Ctyroky, Jiri: *See*—
Barta, Cestmir; Ctyroky, Jiri; Silvestrova, Iraida M.; and Pisarevskij, Jurij V., 4,232,952, Cl. 350-358.000.
Cubbon, Robert C. P.; Braid, John E.; Oates, Alfred E.; and Preston, Ronald, to Laporte Chemicals Limited. Peroxygen compounds. 4,233,462, Cl. 568-564.000.
Cuevas, Ephraim A., to PPG Industries, Inc. Solution mining water soluble salts at high temperatures. 4,232,902, Cl. 299-4.000.
Culkin, John J.: *See*—
Ritsko, Joseph E.; Culkin, John J.; MacInnis, Martin B.; and Acla, Howard L., 4,233,063, Cl. 75-0.5AA.
Cull, Neville L., to Exxon Research & Engineering Co. Aluminum phosphate-alumina compositions and catalysts comprising the same. 4,233,184, Cl. 252-437.000.
Cunningham, Richard N.; Smith, Douglas D.; and Loeffler, Romain E., deceased (by Loeffler, Carolyn R., legal representative), to Johns-Manville Corporation. Method and apparatus for manufacturing a laminated shingle. 4,233,100, Cl. 156-260.000.
Curtil, Remi, to Societe d'Etudes de Machines Thermiques S.E.M.T. Method and device for improving the efficiency of internal combustion engines. 4,232,641, Cl. 123-76.000.
Curtis, Omer E., Jr., to United States Steel Corporation. Dicyclopentadiene polyester resins. 4,233,432, Cl. 528-298.000.
Curtiss, George R., to Cooper Industries, Inc. Free-wheeling overspeed grinder device. 4,232,414, Cl. 51-134.50F.
Curto, Nicholas J., to Owens-Illinois, Inc. Method of forming blown polyethylene terephthalate containers. 4,233,262, Cl. 264-509.000.
Cutler, Morris; and Tamarin, Bernard J., to Vacuum Cleaner Corporation of America, The. Retractable cord reel. 4,232,837, Cl. 242-107.000.
Cybiotronics Limited: *See*—
Chen, Lim B.; and Cher, Lim L., 4,232,865, Cl. 273-311.000.
Czaja, Robert F.; and Grabowski, Edward J. J., to Merck & Co., Inc. Process for preparing indenyl acetic acids. 4,233,457, Cl. 562-428.000.
Czernik, Karl: *See*—
Nittel, Fritz; Czernik, Karl; Sauerteig, Wolfgang; Himmelmann, Wolfgang; and Bergthaller, Peter, 4,233,398, Cl. 430-495.000.
D G T S.r.l.: *See*—
Savelli, Aulo; Grianti, Francesco; Arcozzi, Giovanni; and Di Bari, Leonardo, 4,232,666, Cl. 128-203.250.
Dabby, Franklin W.; and Chesler, Ronald B., to Times Fiber Communications, Inc. Telecommunication systems using optical waveguides. 4,232,938, Cl. 350-96.200.
Dace, Marvin H., Jr. Slip pliers with lock. 4,232,573, Cl. 81-405.000.
Dagani, Michael J., to Ethyl Corporation. Synthesis of 2,2,2-trichloro-1-(N-hydrocarbonpyrryl-2)-ethanol. 4,233,219, Cl. 260-326.50R.
Dai Nippon Insatsu Kabushiki Kaisha: *See*—
Fujishima, Rikio; Nishihara, Kunisuke; and Hosoi, Hideo, 4,233,104, Cl. 156-504.000.
Daikin Kogyo Co. Ltd.: *See*—
Enjo, Naonori; and Aomi, Hideki, 4,232,525, Cl. 60-671.000.
Dale, William A., to Codman and Shurtleff, Inc. Vein holder assembly. 4,232,659, Cl. 128-1.00R.
Dallen, Larry D.: *See*—
Bolton, Edgar A.; and Dallen, Larry D., 4,233,661, Cl. 364-300.000.
Dampier, William P.: *See*—
Derby, Ronald C.; Zelinger, Stanley H.; Dampier, William P.; and Lazzara, Samuel P., 4,232,523, Cl. 60-641.000.
Danfoss A/S: *See*—
Knudsen, Ole F., 4,233,143, Cl. 204-195.00P.
Daniels, John R.: *See*—
Luck, Edward E.; and Daniels, John R., 4,233,360, Cl. 428-310.000.
Dannenberg, Wolfgang: *See*—
Schmand, Horst; and Dannenberg, Wolfgang, 4,233,456, Cl. 562-401.000.
d'Argembeau, Etienne, Y. G. J. Process for the manufacture of brushes. 4,233,260, Cl. 264-243.000.
Darling & Company: *See*—
Wojcik, Herbert W., 4,232,425, Cl. 17-46.000.
Darms, Roland: *See*—
Kvita, Vratislav; Darms, Roland; and Greber, Gerd, 4,233,220, Cl. 260-326.260.
Darrow, Russell E.; Memis, Irving; and Poliak, Richard M., to International Business Machines Corporation. Sealing of integrated circuit modules. 4,233,620, Cl. 357-74.000.
Dart Industries Inc.: *See*—
Valayil, Silvester P.; and Elias, Moenes L., 4,233,111, Cl. 156-666.000.
Valayil, Silvester P.; and Elias, Moenes L., 4,233,112, Cl. 156-666.000.
Valayil, Silvester P.; and Elias, Moenes L., 4,233,113, Cl. 156-666.000.
Data Packaging Corporation: *See*—
Kaplow, Roy; Butz, David E.; and Stenfors, Alan L., 4,233,586, Cl. 335-303.000.
Datwyler, Walter F., Jr.: *See*—
Eifler, Raymond J.; Datwyler, Walter F., Jr.; Statland, Bernard E.; and Sher, Geoffrey, 4,233,033, Cl. 23-232.00E.
Daum, Sol J.: *See*—
Clarke, Robert L.; and Daum, Sol J., 4,233,448, Cl. 546-125.000.
Clarke, Robert L. G.; and Daum, Sol J., 4,233,449, Cl. 546-125.000.

Dauvergne, Jean L. R., to Societe Anonyme Francaise du Ferodo. Assisted braking device. 4,232,519, Cl. 60-550.000.
Davenport, Gordon H.: *See*—
Welling, Conrad G.; Davenport, Gordon H.; Reichert, Guenter; Snyder, Charles M.; Harrold, Milton C.; Donze, Salvatore H.; and Larsen, Frank R., 4,232,903, Cl. 299-8.000.
Davis, James E., to Proctor & Gamble Company, The. Liquid fabric softener. 4,233,164, Cl. 252-8.800.
Davis, Malcolm J.: *See*—
Lewis, William J.; Harper, Leslie R.; Davis, Malcolm J.; and Gardiner, Richard G., 4,232,516, Cl. 60-226.00A.
Davis, Roman: *See*—
Dawson, Daniel J.; Otteson, Kenneth M.; and Davis, Roman, 4,233,328, Cl. 426-250.000.
Davy International AG: *See*—
Maude, John H.; Sterck, Lothar; and Vilshofer, Alfred, 4,233,264, Cl. 422-117.000.
Davy Powergas Inc.: *See*—
Korchnak, Joseph D., 4,233,278, Cl. 423-321.00S.
Dawson, Daniel J.; Otteson, Kenneth M.; and Davis, Roman, to Dynapol. Edible materials colored with polymeric yellow colorant. 4,233,328, Cl. 426-250.000.
Dawson, John L.: *See*—
McWhinnie, John; and Dawson, John L., 4,233,070, Cl. 75-167.000.
Dawson, Peter: *See*—
Jones, Norman; and Dawson, Peter, 4,233,358, Cl. 428-246.000.
Day, Reed H., to Pascal Company, Inc. Dental gingival retraction cord dispenser. 4,232,688, Cl. 132-91.000.
Dayton, Birney D., to Grass Valley Group, The. Sync separator with a look-ahead clamp. 4,233,629, Cl. 358-153.000.
DCA Food Industries, Inc.: *See*—
Chin, Joseph T.; Hochhauser, Arthur M.; and McCarthy, John P., 4,233,016, Cl. 425-288.000.
Dean, George A., to Dean Research Corporation. Accelerating walkway. 4,232,776, Cl. 198-322.000.
Dean Research Corporation: *See*—
Dean, George A., 4,232,776, Cl. 198-322.000.
Dearth, Leonard F.: *See*—
Hammel, Richard L.; Schaefer, Robert H.; Lancia, Frederick N.; Wolfe, William A.; Dearth, Leonard F.; Benton, Stephen L.; Homan, H. Richard; and Bruce, Arthur P., 4,232,798, Cl. 221-12.000.
Deere & Company: *See*—
Vogelaar, Bernard F.; Warman, Bruce L.; and Nelson, James R., 4,233,040, Cl. 55-269.000.
De Fusco, Joseph, to Gema AG. Atomizer device. 4,232,832, Cl. 239-707.000.
Degel, Josef: *See*—
Juntgen, Harald; Knoblauch, Karl; Degel, Josef; Zundorf, Dieter; and Giessler, Klaus, 4,233,117, Cl. 201-6.000.
Dehmel, Georg: *See*—
Breig, Kurt; Dehmel, Georg; and Hamm, Norbert, 4,233,213, Cl. 260-141.000.
De Kock, Cornelis, to ITT Industries, Inc. Arrangement for adjusting the damping force of a shock absorber. 4,232,767, Cl. 188-319.000.
Dell'Acqua, Ernani: *See*—
Ferrari, Lorenzo; Dell'Acqua, Ernani; and Quaglia, Giorgio, 4,233,290, Cl. 424-94.000.
Dellantonio, Ezio F., to Autovox, SpA. Keyboard for the preselection of electromagnetic signals. 4,232,560, Cl. 74-10.330.
Delmon, Bernard; and Van Houte, Ghislain, to Unibra. Reagent for treating flue gases and method of preparation. 4,233,175, Cl. 252-192.000.
deMey, Charles F., II, to Perkin-Elmer Corporation, The. Source lamp positioning apparatus. 4,233,657, Cl. 362-396.000.
Denefe, John C. Two rail overhead conveyor device. 4,232,424, Cl. 17-24.000.
Denlinger, George W.: *See*—
Nodov, Eugene; Scott, Burton W.; Denlinger, George W.; and Sutera, Richard, 4,232,964 Cl. 355-70.000.
Denzel, Theodor; and Hoehn, Hans, to E. R. Squibb & Sons, Inc. 8H-Pyrazolo[1,5-a]pyrazolo[4',3':5,6]pyrido[3,4-e]pyrimidine. 4,233,300, Cl. 424-248.400.
Deraedt, Roger: *See*—
Allais, Andre; Meier, Jean; and Deraedt, Roger, 4,233,305, Cl. 424-258.000.
Allais, Andre; Meier, Jean; and Deraedt, Roger, 4,233,312, Cl. 424-274.000.
Teutsch, Jean G.; and Deraedt, Roger, 4,233,297, Cl. 424-243.000.
Derby, Ronald C.; Zelinger, Stanley H.; Dampier, William P.; and Lazzara, Samuel P. Solar power plant. 4,232,523, Cl. 60-641.000.
DeRoss, Robert W.: *See*—
Stahl, John M.; and DeRoss, Robert W., 4,233,478, Cl. 200-51.090.
Design & Process Engineering, Inc.: *See*—
Khoylian, Rouzas R.; Cowdery, James R.; and Park, David B., 4,232,779, Cl. 198-472.000.
Designs for Vision, Inc.: *See*—
Feinbloom, Richard E., 4,232,934, Cl. 350-96.200.
DeSoto, Inc.: *See*—
McLaughlin, Robert L.; and Wood, Donald C., 4,233,171, Cl. 252-99.000.
McLaughlin, Robert L.; and Wood, Donald C., 4,233,172, Cl. 252-99.000.
Detloff, John C., Jr., to General Motors Corporation. Control mechanism for a vehicle ignition lock. 4,232,538, Cl. 70-239.000.
Deuzeman, Henk J.: *See*—
Coker, Robert J.; Bate, Gary W.; and Deuzeman, Henk J., 4,233,267, Cl. 422-187.000.
Devine, William T.; and Gianopulos, William, to International Business Machines Corporation. Demand powered programmable logic array. 4,233,667, Cl. 364-900.000.
Devroe, Guido: *See*—
Langens, Jan; and Devroe, Guido, 4,233,280, Cl. 423-481.000.
DeWitt, Merl. Lightweight trailer bed construction. 4,232,884, Cl. 280-785.000.
Dexter, Martin; and Steinberg, David H., to Ciba-Geigy Corporation. Hindered phenol hydrazones and compositions stabilized therewith. 4,233,209, Cl. 260-45.85E.
Dial Manufacturing, Inc.: *See*—
Mangam, William M., Jr.; Willis, John J., Jr.; and Jones, Myron, Jr., 4,232,531, Cl. 62-171.000.
Diamond, Marc. Acoustical stringed musical instrument pick-up. 4,232,582, Cl. 84-267.000.
Di Bari, Leonardo: *See*—
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Dick, Helmut, to Atlas Copco Aktiebolag. Tunnelling machine. 4,232,905, Cl. 299-31.000.
Dick, Willy P. A., to Telefonaktiebolaget L M Ericsson. Flame-guard for electrical installations. 4,232,742, Cl. 169-58.000.
Dickerson, Carroll D.; and Stevens, Robert W., to Ford Motor Company. Adjusting sleeve for a wheel assembly. 4,232,880, Cl. 280-661.000.
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Dudeck, Christian; Lehmann, Gunter; Petri, Norbert; Diem, Hans; Fliege, Werner; Meissner, Bernd; Ross, Karl-Heinz; and Muehlthaler, Wolfgang, 4,233,246, Cl. 568-402.000.
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Dieterlen, Paul E.; and Benner, Harold T., Jr., to R. A. Jones & Co. Inc. Pouch forming and filling mechanism with provision for increasing the capacity of the pouches. 4,232,504, Cl. 53-570.000.
Dietl, Ernst: *See*—
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Dietrich-Buchecker, Christiane: *See*—
Franck-Neumann, Michel; Dietrich-Buchecker, Christiane; and Miesch, Michel, 4,233,129, Cl. 204-158.00R.
Dietrich, Walter; and Stephan, Herbert, to Leybold-Heraeus GmbH. Instrument for determining the radiation parameters of a focused charged-particle beam and method. 4,233,515, Cl. 250-397.000.
Dietrich, Walter: *See*—
Aichert, Hans; Dietrich, Walter; Hoffmann, Otto-Horst; Stark, Friedrich; and Stephan, Herbert, 4,233,342, Cl. 427-251.000.
Dighe, Kamalakar D., to Baxter Travenol Laboratories, Inc. Speed and torque control for fractional horsepower motors. 4,233,549, Cl. 318-317.000.
DiMarco, Bernard; Clement, Ralph C.; and Parmenter, Charles W., to Gould Inc. Enclosed fused disconnect switch. 4,233,482, Cl. 200-163.000.
Dingeldein, Elvira: *See*—
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Disston, Horace C., Jr.: *See*—
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Doane, Cyril M. Building construction for multiple units having common walls. 4,232,490, Cl. 52-167.000.
Dobie, Michael J.: *See*—
Smith, Jimmie L.; Honeycutt, John D.; and Dobie, Michael J., 4,232,777, Cl. 198-404.000.
Dobler, Klaus; Zrenner, Christian; Schirmer, Gunter; and Kizler, Alfred, to Robert Bosch GmbH. Apparatus for detecting pressure fluctuations in the combustion chamber of an internal combustion engine. 4,232,545, Cl. 73-35.000.
Dr. Hans Boeckels GmbH & Co.: *See*—
Muller, Karl-Heinz, 4,232,781, Cl. 198-505.000.
Dodwell, Geoffrey M.; and Gambles, Norman E., to Ciba-Geigy Aktiengesellschaft. Photographic polyester film base with subbing layer containing phosphoric acid derivative. 4,233,074, Cl. 430-535.000.
Dollond & Aitschison (Services) Limited: *See*—
Eadon-Allen, Stuart, 4,232,485, Cl. 51-55.000.
Dominick, Ellen K.; and Scherer, George W., to Corning Glass Works. Carbon coating for a starting member used in producing optical waveguides. 4,233,052, Cl. 65-144.000.
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Donze, Salvatore H.: *See*—
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Doonan, David F.; and Moller, Kurt H., to Olin Corporation. Continuous process for the production of monoalkali metal cyanurates. 4,233,444, Cl. 544-192.000.

Dorlars, Alfons; and Neuner, Otto, to Bayer Aktiengesellschaft. Triazolyl-stilbenes. 4,233,440, Cl. 542-458.000.

Dorr-Oliver Incorporated: *See—*
Fitch, Elliot B.; and Albertson, Orris E., 4,232,614, Cl. 110-235.000.

Dorrestijn, Antoon, to Electrochemische Energieconversie N.V. Method for the manufacture of an electrochemical cell or battery and battery made by the method. 4,233,371, Cl. 429-152.000.

Dotson, Ronald L.: *See—*
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Dow Chemical Company, The: *See—*
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Lamson, Junior J.; Hall, Richard H.; Stroiwas, Edward; and Yats, Larry D., 4,233,467, Cl. 585-437.000.
Raines, Dale A.; and Ainsworth, Oliver C., 4,233,221, Cl. 260-340.200.
Tefertiller, Nancy B.; Burdett, Kenneth A.; and Harris, Robert F., 4,233,425, Cl. 525-455.000.

Dow, Douglas. Electric motor vehicle. 4,232,755, Cl. 180-65.00R.

Downs, William T.: *See—*
Muller, George H.; and Downs, William T., 4,232,803, Cl. 222-105.000.

Dowzall, Martin E.; and Houssian, Vazgen J., to Letraset International Limited. Apparatus for use in connection with dry transfer lettering and analogous sheets. 4,232,452, Cl. 33-430.000.

Drabek, Jozef: *See—*
Boger, Manfred; Drabek, Jozef; Mattern, Gunter; and Traber, Walter, 4,233,306, Cl. 424-263.000.

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Dresser Industries, Inc.: *See—*
Sample, Thomas E., Jr.; and Horn, John M., 4,233,366, Cl. 428-405.000.
Williamson, Robert L., 4,232,912, Cl. 308-8.200.

Driscoll, John S.; Khan, A. Hameed; and Chou, Feng-Te, to United States of America, America. Aziridinyl quinone antitumor agents. 4,233,215, Cl. 260-239.0EQ.

D'Souza, Gerard J.; and Radford, Herschel D., to Standard Oil Company (Indiana). Process for the desulfurization of waste gases. 4,233,276, Cl. 423-230.000.

Dudeck, Christian; Lehmann, Gunter; Petri, Norbert; Diem, Hans; Fliege, Werner; Meissner, Bernd; Ross, Karl-Heinz; and Muehlthaler, Wolfgang, to BASF Aktiengesellschaft. Manufacture of aliphatic hydroxycarbonyl compounds etherified with aliphatic groups. 4,233,246, Cl. 568-402.000.

Dufaure, Pierre: *See—*
Jacquet, Bernard; Papantoniou, Christos; Dufaure, Pierre; and Mahieu, Claude, 4,233,430, Cl. 526-259.000.

Duffner, Paul: *See—*
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Dufresne, Jacques. Automatic emergency brake. 4,232,768, Cl. 192-2.000.

Duggan, George L.: *See—*
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Dugle, Thomas E.: *See—*
Orlowski, Gerald J.; and Dugle, Thomas E., 4,232,630, Cl. 119-29.000.

Dumont, Willy, to BBC Brown, Boveri & Company, Limited. Method and apparatus for tube leakage testing. 4,232,546, Cl. 73-40.700.

Duncan, Richard A. Structural and operational improvements for a two row harvester and piler. 4,232,775, Cl. 198-304.000.

Dunn, Edward J., Jr. Method of scavenging steel. 4,233,064, Cl. 75-58.000.

Du Pont de Nemours, E. I., and Company: *See—*
Benin, Joshua, 4,232,835, Cl. 242-46.400.
Cemel, Albert; Chaban, Castulo, Jr.; and Fresco, Albert Z., 4,233,363, Cl. 428-373.000.
Edwards, Donald W.; and Gorondy, Emery J., 4,233,382, Cl. 430-39.000.
Friedel, Horst, 4,233,392, Cl. 430-264.000.
Kinney, George A., 4,233,014, Cl. 425-174.80R.
Menson, Robert C.; Narayanswamy, Venkatachalam; and Burns, Richard C., 4,233,403, Cl. 435-22.000.
Niederhauser, Donald O., 4,233,349, Cl. 428-92.000.
Pfister, Friedrich V., 4,232,434, Cl. 26-86.000.
Rao, V. N. Mallikarjuna; and Ziemecki, Stanislaw B., 4,233,248, Cl. 568-487.000.
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Robinson, Ivan M., 4,233,436, Cl. 528-366.000.
Stull, John R., 4,232,927, Cl. 339-99.00R.
Yunan, Malak E., 4,232,606, Cl. 102-27.00R.

Duprez, Daniel; and Grand, Michel, to ElfUnion. Catalysts for water dealkylation of aromatic hydrocarbons. 4,233,186, Cl. 252-466.00B.

Dyer, Robert F., to Mattel, Inc. Toy safe with alarm. 4,232,474, Cl. 46-2.000.

Dyna Technology, Inc.: *See—*
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Dynapol: *See—*
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Dyroff, David R.; and Lynch, Gary J., to Monsanto Company. Process for stabilizing acetal carboxylate polymers using dialkyl sulfate. 4,233,422, Cl. 525-398.000.

Dyroff, David R.; Lynch, Gary J.; and Papanu, Victor D., to Monsanto Company. Stabilization of polymeric acetal carboxylates using an acetal. 4,233,423, Cl. 525-398.000.

E M I Limited: *See—*
Cole, Allan, 4,232,556, Cl. 73-626.000.

E. R. Squibb & Sons, Inc.: *See—*
Denzel, Theodor; and Hoehn, Hans, 4,233,300, Cl. 424-248.400.
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Eadon-Allen, Stuart, to Dollond & Aitschison (Services) Limited. Apparatus for polishing curved surfaces. 4,232,485, Cl. 51-55.000.

Earl Enterprises, Inc., The: *See—*
Muelling, Earl L., 4,232,472, Cl. 43-61.000.

Eastes, Walter L., to Owens-Corning Fiberglas Corporation. Method for producing calcium borates. 4,233,051, Cl. 65-134.000.

Eastman Kodak Company: *See—*
Ateya, Antoun I.; and Stryjewski, Walter A., 4,232,959, Cl. 355-3.0FU.
Columbus, Richard L., 4,233,029, Cl. 23-230.00R.
Fernandez, Jose M.; Cameron, Robert G.; and Walsh, Edward J., 4,233,389, Cl. 430-140.000.
Petropoulos, Constantine C.; Reynolds, George A.; and VanAllan, James A., 4,233,443, Cl. 542-454.000.
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Sublett, Bobby J., 4,233,196, Cl. 260-29.20N.

Eaton Corporation: *See—*
Migrin, Robert S.; and Olson, Jerry A., 4,232,549, Cl. 73-202.000.

Eaton, Homer L., to Eaton-Leonard Corporation. Method and apparatus for making bent pipe. 4,232,813, Cl. 228-147.000.

Eaton-Leonard Corporation: *See—*
Eaton, Homer L., 4,232,813, Cl. 228-147.000.

Ebauches S.A.: *See—*
Besson, Rene; and Breguet, Jean-Luc, 4,232,464, Cl. 40-451.000.
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Klein, Keith W.; Palmieri, Joseph M.; and Eckart, Gregory C., 4,233,640, Cl. 361-44.000.

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Ed. Zublin Aktiengesellschaft: *See—*
Hahn, Volker; and Fastenau, Werner, 4,232,822, Cl. 238-7.000.

Eddy, William R., to Phillips Petroleum Company. Dispensing nozzle. 4,232,629, Cl. 118-669.000.

Edelmann, Ludwig, to C. Reichert Optische Werke, AG. Device for freeze drying and synthetic resin impregnation when necessary of small biological objects for electron microscopic examination. 4,232,453, Cl. 34-92.000.

Edwards, Donald W.; and Gorondy, Emery J., to Du Pont de Nemours, E. I., and Company. Electrostatic transfer of magnetically held toner images. 4,233,382, Cl. 430-39.000.

Edwards, John V.: *See—*
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Eggermann, Paul P., to Inseco Associates, Inc. Method and apparatus for installation of quench car track for coke oven batteries. 4,232,823, Cl. 238-7.000.

Eggermont, Ludwid D. J., to U.S. Philips Corporation. Arrangement for decoding a signal encoded by means of adaptive delta modulation. 4,233,684, Cl. 375-30.000.

Eguchi, Wataru; Harada, Makoto; Tanigaki, Masataka; and Tada, Yutaka, to Kyoto University, The President of. Device for measuring thermal conductivity of liquids. 4,232,543, Cl. 73-15.00A.

Eichfeld, Timothy J.; and Disston, Horace C., Jr. Work holding table. 4,232,856, Cl. 269-93.000.

Eifler, Raymond J.; Datwyler, Walter F., Jr.; Statland, Bernard E.; and Sher, Geoffrey, to Bendix Autolite Corporation. Method and apparatus for measuring the O_2 content of a gas. 4,233,033, Cl. 23-232.00E.

Elast-O-Cor Products & Engineering Limited: *See—*
Macierewicz, Jacek J.; Richters, Johannes J.; and St. John, James E., 4,233,160, Cl. 210-512.00M.

Elder, William L.; Williams, Kevin G.; and Burough, Irvin G., to Andros Incorporated. Gas analyzer. 4,233,513, Cl. 250-343.000.

Electric Machinery Mfg. Company: *See—*
Iverson, James R.; and Alcock, Derrick N., 4,233,643, Cl. 361-344.000.

Electrochemische Energieconversie N.V.: *See—*
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ElfUnion: *See—*
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Valayil, Silvester P.; and Elias, Moenes L., 4,233,112, Cl. 156-666.000.

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Elias, Robert T.; and Holtman, Dennis C., to Johnson & Johnson Baby Products Company. Thin-skin stabilization of pads of fluffed pulp. 4,233,345, Cl. 427-325.000.
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Ellis, James N., to United States of America, Army. Vent actuated shorting switch. 4,233,554, Cl. 320-46.000.
Ellsberg, Thomas R. Safety interlock system. 4,233,642, Cl. 361-172.000.
Elser, Dieter, to Zahnradfabrik Friedrichshafen AG. Steering control valve for power booster steering mechanisms. 4,232,586, Cl. 91-467.000.
Emerson Electric Co.: *See*—
Behr, Joseph L., 4,232,528, Cl. 62-140.000.
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EMI Limited: *See*—
LeMay, Christopher A. G., 4,233,662, Cl. 364-414.000.
Emmett, John L.; Jacobs, Ralph R.; Krupke, William F.; and Weber, Marvin J., to United States of America, Energy. Tunable, rare earth-doped solid state lasers. 4,233,570, Cl. 331-94.50F.
Emslie, Alan E.: *See*—
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Endo, Isao, to General Electric Company. Primer compositions for silicone rubber compositions. 4,233,428, Cl. 525-507.000.
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Enjo, Naonori; and Aomi, Hideki, to Daikin Kogyo Co. Ltd. Working fluid for Rankine cycle. 4,232,525, Cl. 60-671.000.
Environmental Sciences Associates, Inc.: *See*—
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Eresen, Nahit; Schroer, Klaus; and Becker, Hans J., to Uranerzbergbau GmbH. Process for selective separation of uranium from solutions by means of an ion exchanger. 4,233,272, Cl. 423-7.000.
Ericson, Kurt S. B. Automatic valve device for sanitation waste pipes. 4,232,706, Cl. 137-375.000.
Eriksen, Gunnar, to Thune-Eureka A/S. Stretching machine for treating removable belts supported on rollers. 4,232,435, Cl. 26-106.000.
Ernst, Edwin F. Method of making plastic bag construction in serial roll form. 4,232,589, Cl. 493-223.000.
Ernst Leitz Wetzlar GmbH: *See*—
Hagner, Willi; and Frimmel, Horst, 4,233,650, Cl. 362-32.000.
Ernstsson, Ernst G.; and Fuchs, Alfred, to Tetra Pak International AB. Arrangement for the sterilizing of a packing material web. 4,233,271, Cl. 422-300.000.
Escher Wyss Limited: *See*—
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Eschwey, Helmut; Galinke, Joachim, deceased (by Jansen, Renate Galinke nee, heir); and Wiemers, Norbert, to Henkel Kommanditgesellschaft auf Aktien (Henkel KGAA). Water-dispersed film-forming lacquer containing air-drying alkyd resins and an ethylene oxide adduct of an unsaturated aliphatic-substituted phenol. 4,233,194, Cl. 260-22.00A.
Eskofot Research A/S: *See*—
Shelffo, Loren E., 4,232,628, Cl. 118-653.000.
Essers, Wilhelmus G., to U.S. Philips Corporation. Method of and device for plasma MIG-welding. 4,233,489, Cl. 219-121.00P.
Esters, Ernie B. Modular dynamoelectric machine. 4,233,532, Cl. 310-46.000.
Estradier, Francoise: *See*—
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Ettenberg, Michael: *See*—
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Gallo, Donald J.; Roscetti, Thomas L.; Emslie, Alan E.; and Hammitt, Frederick G., 4,232,710, Cl. 138-39.000.
Kaye, Larry A.; and Koros, Robert M., 4,233,269, Cl. 422-207.000.
Murrell, Lawrence L.; Kim, Chang J.; and Grenoble, Dane C., 4,233,139, Cl. 208-112.000.
Whittingham, M. Stanley; and Jacobson, Allan J., 4,233,375, Cl. 429-194.000.
Fabbri, William C., to Keene Corporation. Work area lighting system. 4,233,651, Cl. 362-33.000.
Fabrig, Paul, to Womako Maschinenkonstruktionen GmbH. Method and means for manipulating marginally perforated note books prior to introduction of spirals. 4,232,858, Cl. 270-53.000.
Fabryka Przyrzadow i Uchwytow PONAR-BIAL Zaklad Nr 1-Wiodacy: *See*—
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Fagan, John C., to Artag Plastics Corporation. Vending machine control system. 4,233,660, Cl. 364-104.000.
Fair, James V., to V & W Parts & Machine Shops, Inc. Method for reconditioning an engine head. 4,232,437, Cl. 29-156.40R.
Fairbanks, Norman P.: *See*—
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Falce, Louis R., to Varian Associates, Inc. Electron tube with reduced secondary emission. 4,233,539, Cl. 315-5.380.
Fancher, Llewellyn W.; and Baker, Don R., to Stauffer Chemical Company. Biocidal isothiourea compounds. 4,233,318, Cl. 424-326.000.
Farber, Sheldon: *See*—
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Farr, Glyn P. R., to Girling Limited. Vehicle load sensing assemblies. 4,232,909, Cl. 303-22.00R.
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Fastenau, Werner: *See*—
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Faughnan, Brian: *See*—
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Favre, Jean-Paul; Perrin, Joseph; Philbert, Michel; and Surget, Jean, to Office National d'Etudes et de Recherches Aerospatiales (ONERA). Method and an apparatus for measuring the bonding power of an adhesive material. 4,232,559, Cl. 73-827.000.
Fawzi, Mahdi B., to Procter & Gamble Company, The. Stabilized radiographic scanning agents. 4,233,284, Cl. 424-1.000.
Feinbloom, Richard E., to Designs for Vision, Inc. Universal connector assembly particularly adapted for use with fiber optic cables. 4,232,934, Cl. 350-96.200.
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Fellmann, Ruedi, to Max Langenstein Feld- und Gartengerate. Hand tool with removable extension handle. 4,232,422, Cl. 16-110.00R.
Fenner, Gary W.; and Ragi, Elias G., to Union Carbide Corporation. Method for enhanced heat transfer. 4,232,728, Cl. 165-1.000.
Fernandez, Jose M.; Cameron, Robert G.; and Walsh, Edward J., to Eastman Kodak Company. Fluorinated 1-hydroxy-2-naphthamide coupler compositions and photographic elements suited to forming integral sound tracks. 4,233,389, Cl. 430-140.000.
Ferrari, Lorenzo; Dell'Acqua, Ernani; and Quaglia, Giorgio, to SPA-Societa Prodotti Antibiotici, S.p.A. Method of treating domestic animals. 4,233,290, Cl. 424-94.000.
Ferro, Armand P., to General Electric Company. Start winding for solenoidal electric field discharge lamps. 4,233,541, Cl. 315-70.000.
Fiato, Rocco A., to Union Carbide Corporation. Homologation process for the production of ethanol from methanol. 4,233,466, Cl. 568-902.000.

Fiberglas Canada Limited: *See—*
Coker, Robert J.; Bate, Gary W.; and Deuzeman, Henk J., 4,233,267, Cl. 422-187.000.

Fierlbeck, Walter: *See—*
Pawlik, Rudolf; and Fierlbeck, Walter, 4,233,494, Cl. 219-382.000.

Fink, Herbert; Grumbach, Egon; and Pennewiss, Horst, to Rohm GmbH. Method of sizing textile yarns and sizing agents therefor. 4,233,200, Cl. 260-33.8UA.

Finlay-Maxwell, David, to John Gladstone & Company (Engineering) Limited. Distillation method for solvent recovery. 4,233,120, Cl. 203-2.000.

Firestone Tire & Rubber Company, The: *See—*
Bohm, Georg G. A.; and Barbin, William W., 4,233,013, Cl. 425-174.400.

Firmenich SA: *See—*
Flament, Ivon, 4,233,332, Cl. 426-537.000.

Fischbeck, Kenneth H.; Larsson, Stig-Goran; and Sultan, S. Bertil, to Xerox Corporation. Hydrodynamically damped pressure pulse droplet ejector. 4,233,610, Cl. 346-140.00R.

Fisher, John M., to B. F. Goodrich Company, The. Method of making an inflatable flotation device. 4,233,102, Cl. 156-292.000.

Fisher, William B.: *See—*
Balint, Laszlo J.; Crescentini, Lamberto; Fisher, William B.; and Sahli, Muhammad S., 4,233,279, Cl. 423-385.000.

Fister, Lee H., Jr., to August Incorporated. Seating unit and method of construction. 4,232,899, Cl. 297-229.000.

Fitch, Elliot B.; and Albertson, Orris E., to Dorr-Oliver Incorporated. Process of incineration with predrying of moist feed using hot inert particulates. 4,232,614, Cl. 110-235.000.

Flagg, Rodger H.: *See—*
Carr, Randall; Geoffroy, L. E.; Flagg, Rodger H.; and Carr, Donald L., 4,233,132, Cl. 204-169.000.

Flament, Ivon, to Firmenich SA. Use of bicyclic nitrogen-containing derivatives as flavoring ingredients. 4,233,332, Cl. 426-537.000.

Flanders Filters, Inc.: *See—*
Allan, Thomas T., 4,233,044, Cl. 55-355.000.

Flatt, James H., to General Motors Corporation. Dump control for turbine engine gate valve actuator. 4,232,514, Cl. 60-39.250.

Flick, Sally J. Sewing form. 4,232,805, Cl. 223-37.000.

Fliege, Werner: *See—*
Dudeck, Christian; Lehmann, Gunter; Petri, Norbert; Diem, Hans; Fliege, Werner; Meissner, Bernd; Ross, Karl-Heinz; and Muehlthaler, Wolfgang, 4,233,246, Cl. 568-402.000.

Floyd, Middleton B., Jr.; Grudzinskas, Charles V.; and Chen, Sow-Mei L., to American Cyanamid Company. Novel vinyl-stannyl derivatives. 4,233,231, Cl. 260-429.700.

Floyd, Middleton B., Jr., to American Cyanamid Company. 15-Deoxy-16-hydroxy-16-allenyl prostane derivatives of the E and F series. 4,233,453, Cl. 560-121.000.

FMC Corporation: *See—*
Cross, Stephen D., 4,232,780, Cl. 198-479.000.
Hait, James M., 4,232,705, Cl. 137-899.100.

Fohl, Artur, to REPA Feinstanzwerk GmbH. Re-tightener with pyrotechnic propellant charge for safety-belt automatic wind-up devices. 4,232,836, Cl. 242-107.000.

Foote Mineral Company: *See—*
Koul, Maharaj K., 4,233,065, Cl. 75-134.00S.

Forbom, Arvo: *See—*
Forsback, Torbjorn; and Forbom, Arvo, 4,232,410, Cl. 4-415.000.

Ford Motor Company: *See—*
Bourgeous, Clarence G.; and Miller, Oliver G., 4,232,883, Cl. 280-759.000.
Chattha, Mohinder S., 4,233,415, Cl. 525-161.000.
Dickerson, Carroll D.; and Stevens, Robert W., 4,232,880, Cl. 280-661.000.
Gandhi, Haren S.; and Shelef, Mordecai, 4,233,188, Cl. 252-470.000.
Gandhi, Haren S.; Kummer, Joseph T.; Shelef, Mordecai; Stepien, Henryk K.; and Yao, Hsien C., 4,233,189, Cl. 252-472.000.
Logothetis, Eleftherios M.; Laud, Kamlakar R.; and Park, John K., 4,232,441, Cl. 29-612.000.
Taylor, Stephen C., 4,233,685, Cl. 455-151.000.

Forgeot, Marcel: *See—*
Simon-Lavoine, Nicole; and Forgeot, Marcel, 4,233,291, Cl. 424-177.000.

Formby, John A., to John Formby & Company Limited. Conveyor control apparatus. 4,233,499, Cl. 235-92.0MP.

Forsback, Torbjorn; and Forbom, Arvo, to Oy Wartsila Ab. Water closet. 4,232,410, Cl. 4-415.000.

Fotis, Peter: *See—*
Hoff, Glen R.; and Fotis, Peter, 4,233,182, Cl. 252-429.00C.
Hoff, Glen R.; and Fotis, Peter, 4,233,253, Cl. 260-987.000.

Fowler, James E.: *See—*
Spaziani, Frederick F.; and Fowler, James E., 4,233,136, Cl. 204-195.00L.

Framatome: *See—*
Brunaud, Daniel, 4,232,442, Cl. 29-727.000.

Franck-Neumann, Michel; Dietrich-Buchecker, Christiane; and Miesch, Michel, to Roussel Uclaf. Process of preparation of alkyl esters of dl cis chrysanthemic acid. 4,233,129, Cl. 204-158.00R.

Frank, Bruce A., to Baffle Stove Company Inc. Baffled stove. 4,232,650, Cl. 126-77.000.

Franklin, Barbara J., to Texaco Inc. Aqueous polysaccharide-containing fluid having superior filterability and stability and their use in recovering oil. 4,232,739, Cl. 166-275.000.

Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H.: *See—*
Theurer, Josef, 4,232,610, Cl. 104-3.000.

Freitag, Dieter: *See—*
Idel, Karsten; Vernaleken, Hugo; Freitag, Dieter; Reiff, Gunther; and Rudolph, Hans, 4,233,431, Cl. 525-462.000.

Frentrup, Adolf: *See—*
Kempf, Alfons, 4,232,613, Cl. 109-40.000.

Fresco, Albert Z.: *See—*
Cemel, Albert; Chaban, Castulo, Jr.; and Fresco, Albert Z., 4,233,363, Cl. 428-373.000.

Friedberg, Martin F. Sliding fastener. 4,232,429, Cl. 24-205.11R.

Friedberg, Martin F. Device for connecting the ends of a separable zipper. 4,232,430, Cl. 24-205.11R.

Friedel, Horst, to Du Pont de Nemours, E. I., and Company. Light-sensitive material for tanning development comprising pretreated carbon. 4,233,392, Cl. 430-264.000.

Friedman, Jules D.; and Saraf, Lumdas H., to International Business Machines Corporation. Method for forming semiconductor contacts. 4,233,337, Cl. 427-84.000.

Frimmel, Horst: *See—*
Hagner, Willi; and Frimmel, Horst, 4,233,650, Cl. 362-32.000.

Frissora, Joseph R.; and Platt, Michael H., to Owens-Illinois, Inc. Solar energy collection. 4,232,655, Cl. 126-420.000.

Fritz, Douglas P.; and Elias, Ronald J., to Topps Chewing Gum, Incorporated. Low density chewing gum product and method of making the same. 4,233,319, Cl. 426-5.000.

Fritze, Hartwig, to Escher Wyss Limited. Manufacturing of instant products from legumes. 4,233,322, Cl. 426-46.000.

Frommer, Moshe A.: *See—*
Kraus, Menahem A.; Frommer, Moshe A.; Nemas, Mara; and Gutman, Rodika, 4,233,434, Cl. 528-337.000.

Frost, Edward G. Comprehensive automatic mobile radio telephone system. 4,233,473, Cl. 179-2.0EB.

Fruehauf Corporation: *See—*
Ringe, Stephen J., 4,232,891, Cl. 292-218.000.

Fuchigami, Mitsuru, to Mitsubishi Paper Mills, Ltd. Micro-capsules and method for their production. 4,233,178, Cl. 252-316.000.

Fuchs, Alfred: *See—*
Ernstsson, Ernst G.; and Fuchs, Alfred, 4,233,271, Cl. 422-300.000.

Fuchs, Rainer A.; Hammann, Ingeborg; and Behrenz, Wolfgang, to Bayer Aktiengesellschaft. Insecticidal and acaricidal O-alkyl-O-[1-(2-cyanoalkyl)-5-halo-1,2,4-triazol(3)yl]-(thiono)(thiol)-phosphoric(-phosphonic) acid esters and ester-amides. 4,233,293, Cl. 424-200.000.

Fuel Injection Development Corporation: *See—*
Leshner, Ervin; and Leshner, Michael D., 4,232,643, Cl. 123-440.000.

Fuji Photo Film Co., Ltd.: *See—*
Harada, Tooru; and Fujita, Shinsaku, 4,233,237, Cl. 260-509.000.
Shiba, Keisuke; and Kita, Nobuyuki, 4,233,393, Cl. 430-265.000.
Tada, Sugihiko; and Inukai, Yuzo, 4,233,397, Cl. 430-449.000.

Fuji Photo Optical Co., Ltd.: *See—*
Numata, Saburo; and Fujino, Shinichiro, 4,232,955, Cl. 354-51.000.

Fujihira, Yuji: *See—*
Abe, Masayuki; and Fujihira, Yuji, 4,233,582, Cl. 335-213.000.

Fujimoto, Osamu: *See—*
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Fujinaga, Shigeki: *See—*
Maruyama, Shigeo; Nishikaichi, Yuji; Fujinaga, Shigeki; and Miura, Tatsuya, 4,233,491, Cl. 219-125.100.

Fujino, Shinichiro: *See—*
Numata, Saburo; and Fujino, Shinichiro, 4,232,955, Cl. 354-51.000.

Fujishima, Rikio; Nishihara, Kunisuke; and Hosoi, Hideo, to Toshiba Kikai Kabushiki Kaisha; and Dai Nippon Insatsu Kabushiki Kaisha. Automatic web splicing and feeding apparatus. 4,233,104, Cl. 156-504.000.

Fujita, Shinichi: *See—*
Ueda, Takeo; Fujita, Shinichi; Tachiki, Hideo; and Asano, Shuichi, 4,232,433, Cl. 24-230.00A.

Fujita, Shinsaku: *See—*
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Fujita, Tadashi; Oya, Masayuki; Watanabe, Toshio; and Chiba, Takehisa, to Santen Pharmaceutical Co., Ltd. Antiarteriosclerotic N-(mercaptoacyl)-histidines. 4,233,310, Cl. 424-273.00R.

Fujitsu Limited: *See—*
Kawabe, Yunosuke, 4,233,091, Cl. 148-175.000.
Takahashi, Yukio; and Toyoda, Kazuhiro, 4,233,525, Cl. 307-234.000.

Fujiwhara, Mitsuto; Matsuo, Syunji; Masukawa, Toyoaki; Kaneko, Yutaka; and Kawasaki, Mikio, to Konishiroku Photo Industry Co., Ltd. Light-sensitive silver halide photographic material containing tetrazolium compounds. 4,233,400, Cl. 430-523.000.

Fukahori, Hidehiko; Iwashita, Tomonori; and Mashimo, Yukio, to Canon Kabushiki Kaisha. Means for advancing film in cameras held in various film frame orientations. 4,232,958, Cl. 354-212.000.

Fukuhara, Akinobu: *See—*
Ozaki, Kiyoji; Fukuhara, Akinobu; Hosoi, Takuji; and Sagi, Yasuo, 4,233,137, Cl. 208-48.00Q.

Fultz, Duane A., to Dow Chemical Company, The. Panel and method for the preparation thereof. 4,233,361, Cl. 428-313.000.

Fun-Tech Products Company: *See—*
Orlowski, Gerald J.; and Dugle, Thomas E., 4,232,630, Cl. 119-29.000.

Funada, Fumiaki; and Shimizu, Keiichiro, to Sharp Kabushiki Kaisha. Field effect mode liquid crystal display. 4,232,947, Cl. 350-341.000.

Furukawa, Kazuo; and Furukawa, Sumio, to Nippon Telegraph and Telephone Public Corporation; and Hitachi, Ltd. Redundant bubble memory control system. 4,233,669, Cl. 365-15.000.

Furukawa, Sumio: *See*—
Furukawa, Kazuo; and Furukawa, Sumio, 4,233,669, Cl. 365-15.000.
Furuya, Katusuke: *See*—
Watanabe, Kenkichi; and Furuya, Katusuke, 4,232,690, Cl. 133-8.00R.
Fussner, Paul, to Robert Bosch GmbH. Fluid-sealed, electromagnetic valve operating structure, particularly for combustion engine fuel injection system. 4,233,584, Cl. 335-260.000.
Futaba Denshi Kogyo K.K.: *See*—
Morimoto, Kiyoshi, 4,233,613, Cl. 357-16.000.
G & M Enterprises, Inc.: *See*—
Glenn, Ronnie D.; and Myers, Claude V., 4,232,627, Cl. 440-61.000.
Gaertner, Robert F., to United States of America, Navy. Regulated dual DC power supply. 4,233,558, Cl. 323-17.000.
GAF Corporation: *See*—
Bondoc, Alfredo A.; Canfield, V. Robert; and Ziegler, B. Randall, 4,233,353, Cl. 428-141.000.
Chakrabarti, Paritosh M., 4,233,229, Cl. 260-401.000.
Gruber, Bruce A.; and Lorenz, Donald H., 4,233,441, Cl. 542-419.000.
Gruber, Bruce A.; and Lorenz, Donald H., 4,233,442, Cl. 542-419.000.
Galafassi, Pierre: *See*—
Koller, Josef; Horn, Ulrich; Moser, Peter; Motter, Manfred; and Galafassi, Pierre, 4,233,028, Cl. 8-534.000.
Gali Mallofre, Salvador. System for starting internal combustion engines. 4,232,521, Cl. 60-612.000.
Galimov, Apas G.: *See*—
Antipov, Georgy A.; Gelfand, Mikhail L.; Goldshtein, Boris G.; Rutgaizer, Mikhail I.; Suut, Nikolai K.; Tsipenjuk, Yakov I.; Shishulin, Jury P.; Galimov, Apas G.; Sutyagin, Oleg Y.; and Yankovsky, Oleg A., 4,232,750, Cl. 173-93.600.
Galinke, Joachim, deceased: *See*—
Eschwey, Helmut; Galinke, Joachim, deceased; and Wiemers, Norbert, 4,233,194, Cl. 260-22.00A.
Gallivan, Robert M.; and Mattschei, Peter K., to American Can Company. Fractation of oil obtained by pyrolysis of lignocellulosic materials to recover a phenolic fraction for use in making phenol-formaldehyde resins. 4,233,465, Cl. 568-727.000.
Gallo, Donald J.; Roscetti, Thomas L.; Emslie, Alan E.; and Hammitt, Frederick G., to Exxon Research & Engineering Co. Liquid pipeline extended vane elbow. 4,232,710, Cl. 138-39.000.
Gambardella, Antonio; and Panigada, Marco, to SGS-ATES Componenti Elettronici S.p.A. Passivating bath for semiconductive bodies. 4,233,133, Cl. 204-181.00N.
Gambles, Norman E.: *See*—
Dodwell, Geoffrey M.; and Gambles, Norman E., 4,233,074, Cl. 430-535.000.
Gamell, Joseph A., to Joseph Gamell Industries, Inc. Rotary motor. 4,232,991, Cl. 415-90.000.
Gandhi, Haren S.; and Shelef, Mordecai, to Ford Motor Company. Catalyst for treating exhaust gas from an internal combustion engine. 4,233,188, Cl. 252-470.000.
Gandhi, Haren S.; Kummer, Joseph T.; Shelef, Mordecai; Stepien, Henryk K.; and Yao, Hsien C., to Ford Motor Company. Catalyst of rhodium on zirconia. 4,233,189, Cl. 252-472.000.
Garcia, Robert I., to Innovative Chemicals, Inc. Ozone produced by chemonuclear generation. 4,233,126, Cl. 204-157.10H.
Gardiner, Richard G.: *See*—
Lewis, William J.; Harper, Leslie R.; Davis, Malcolm J.; and Gardiner, Richard G., 4,232,516, Cl. 60-226.00A.
Gardocki, Joseph F., to McNeilab, Inc. Analgesic potentiation. 4,233,313, Cl. 424-274.000.
Gardocki, Joseph F., to McNeilab, Inc. Analgesic potentiation. 4,233,314, Cl. 424-317.000.
Gardocki, Joseph F., to McNeilab, Inc. Analgesic potentiation. 4,233,315, Cl. 424-317.000.
Gardocki, Joseph F., to McNeilab, Inc. Analgesic potentiation. 4,233,316, Cl. 424-317.000.
Gardocki, Joseph F., to McNeilab, Inc. Analgesic potentiation. 4,233,317, Cl. 424-317.000.
Garrett Corporation, The: *See*—
Roberge, Frank L., 4,232,695, Cl. 137-1.000.
Garrod, Norman J. Improvements in and relating to the manufacture of record sleeves. 4,232,593, Cl. 493-224.000.
Garron, Stephen A., to Singer Company, The. One-step buttonholer with hall effect sensor. 4,232,617, Cl. 112-158.00B.
Gary, Fred J. Heat recovery device for use in return air duct of forced air furnace for recovering heat from the flue of such furnace. 4,232,654, Cl. 126-400.000.
Gaschler, Erich, to Volkswagenwerk Aktiengesellschaft. Seal for an eccentric-rotor machine. 4,233,004, Cl. 418-144.000.
Gasper, Kenneth E., to Olin Corporation. Liquid polymer hydration. 4,233,265, Cl. 422-135.000.
Gastaldi, Francesco Saverio Maria. Spray dryer. 4,233,114, Cl. 159-4.00D.
Gat, Arnon: *See*—
Gerzberg, Levy; Gat, Arnon; Melen, Roger; and Gibbons, James F., 4,233,671, Cl. 365-105.000.
Gathers, Glen E.: *See*—
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Gau, Wolfgang: *See*—
Schiweck, Hubert; Steinle, Georg; Muller, Lutz; Gau, Wolfgang; and Munir, Mohammad, 4,233,439, Cl. 536-4.000.
Gazuit, Georges, to Goodyear Tire & Rubber Company, The. Isostable tubular tire. 4,232,723, Cl. 152-350.000.
Gea Luftkuehlergesellschaft Happel GmbH & Co.: *See*—
Ingram, Jocely P.; Kassat, Harry; and Kolenda, Herbert, 4,232,729, Cl. 165-39.000.
Gebruder Lodige Maschinenbau GmbH: *See*—
Lucke, Roland; and Lipp, Eberhard, 4,233,676, Cl. 366-147.000.
Geil, Ronald J., to Gould Inc. Priming apparatus for liquid ink writing instruments. 4,232,702, Cl. 137-115.000.
Geissler, Udo M., to Patent-Treuhand-Gesellschaft. Adjustable direct and bounce photoflash unit. 4,233,648, Cl. 362-17.000.
Gelfand, Mikhail L.: *See*—
Antipov, Georgy A.; Gelfand, Mikhail L.; Goldshtein, Boris G.; Rutgaizer, Mikhail I.; Suut, Nikolai K.; Tsipenjuk, Yakov I.; Shishulin, Jury P.; Galimov, Apas G.; Sutyagin, Oleg Y.; and Yankovsky, Oleg A., 4,232,750, Cl. 173-93.600.
Gema AG: *See*—
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General Battery Corporation: *See*—
Heiser, Joseph I.; and Erb, Edgar M., 4,233,370, Cl. 429-82.000.
General Corporation, The: *See*—
Sugihara, Yasumasa, 4,233,627, Cl. 358-143.000.
General Dynamics Corporation Pomona Division: *See*—
Lair, Clair K., 4,232,605, Cl. 102-8.000.
General Electric Company: *See*—
Arendt, Ronald H., 4,233,282, Cl. 423-598.000.
Barone, Michael R., 4,233,535, Cl. 310-256.000.
Bigelow, John E., 4,233,593, Cl. 340-365.00C.
Boldebuck, Edith M.; Banucci, Eugene G.; and Byrne, Martin A., 4,233,435, Cl. 528-350.000.
Brissey, George E.; and Gathers, Glen E., 4,232,772, Cl. 192-114.00R.
Castleberry, Donald E., 4,233,603, Cl. 340-783.000.
Chernoch, Joseph P., 4,233,567, Cl. 331-94.50P.
Endo, Isao, 4,233,428, Cl. 525-507.000.
Ferro, Armand P., 4,233,541, Cl. 315-70.000.
Grummer, William L.; and Hendriks, Hendrik B., 4,233,522, Cl. 307-116.000.
Hickok, Robert L., 4,233,543, Cl. 315-75.000.
Johnson, Peter D.; and Jones, Charles E., 4,233,023, Cl. 431-362.000.
Kingsley, Jack D., 4,233,514, Cl. 250-370.000.
Klein, Keith W.; Palmieri, Joseph M.; and Eckart, Gregory C., 4,233,639, Cl. 361-44.000.
Klein, Keith W.; Palmieri, Joseph M.; and Eckart, Gregory C., 4,233,640, Cl. 361-44.000.
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Lown, Harold, 4,233,533, Cl. 310-59.000.
Payne, Thomas R.; and Baker, Alfred L., 4,233,498, Cl. 219-490.000.
Pierce, Linden W., 4,232,551, Cl. 73-350.000.
Stalker, Kenneth W.; Zelahy, John W.; and Fairbanks, Norman P., 4,232,995, Cl. 415-172.00A.
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General Foods Limited: *See*—
Hurlow, Gerald S.; Blain, Jean R.; Coombes, Michael; Richard, Jean-Claude; and Hitchinson, Patrick W., 4,232,598, Cl. 99-483.000.
General Motors Corporation: *See*—
Bierlein, John C.; and Shipek, Edward J., 4,233,071, Cl. 75-231.000.
Detloff, John C., Jr., 4,232,538, Cl. 70-239.000.
Flatt, James H., 4,232,514, Cl. 60-39.250.
Hammer, Ganz G., Jr., 4,233,123, Cl. 204-129.650.
Kimberlin, Dan R., 4,232,571, Cl. 74-878.000.
Reider, Samuel B., 4,232,527, Cl. 60-754.000.
Shea, James M.; Tobin, Michael F.; and Anderson, Stanley E., 4,232,585, Cl. 91-432.000.
General Solar Energy Corporation: *See*—
Kaplow, Roy; and Lewis, Marvin C., 4,232,731, Cl. 165-48.00S.
Genesi, Robert C., to Sprague Electric Company. Integrated circuit with power transistor. 4,233,618, Cl. 357-35.000.
Genjida, Fumihide; Nasuno, Toyoaki; Kobayashi, Hideo; and Ii, Motohiko, to Sanyo Chemical Industries, Limited. Water-glycol hydraulic fluid containing polyoxyalkylene ethers. 4,233,170, Cl. 252-73.000.
Geoffroy, L. E.: *See*—
Carr, Randall; Geoffroy, L. E.; Flagg, Rodger H.; and Carr, Donald L., 4,233,132, Cl. 204-169.000.
Gerigk, Gunter: *See*—
Hammer, Klaus-Dieter; Gerigk, Gunter; and Klendauer, Wolfgang, 4,233,341, Cl. 427-230.000.
Gerritsen, Jan, to U.S. Philips Corporation. Color television display device comprising a deflection coil unit provided with a deflection coil for the vertical deflection and deflection coil unit for such a display device. 4,233,547, Cl. 315-368.000.
Gerzberg, Levy; Gat, Arnon; Melen, Roger; and Gibbons, James F., to Stanford University. Read only memory and integrated circuit and method of programming by laser means. 4,233,671, Cl. 365-105.000.
Gessford, James D. Solar collector panel. 4,232,658, Cl. 126-441.000.
Gestetner Limited: *See*—
Selman, Thomas G., 4,232,602, Cl. 101-132.000.
Gharadjedaghi, Fereydoun; and Le Fur, Bernard, to Ebauches S.A. Liquid crystal alignment layers. 4,232,946, Cl. 350-320.000.
Ghosh, Bidhan C.; Chopra, Gopal M.; and Sen, Soumendra N., to Indian Explosives Limited. Method for producing improved gelatine explosive compositions. 4,233,095, Cl. 149-95.000.

Giacopelli, Umberto; Grassi, Bruno; and Crabbe, Rene, to Solvay & Cie. Membrane cell with an electrode for the production of a gas. 4,233,147, Cl. 204-266.000.
Gianopulos, William: *See—*
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Gibbons, James F.: *See—*
Gerzberg, Levy; Gat, Arnon; Melen, Roger; and Gibbons, James F., 4,233,671, Cl. 365-105.000.
Gibson, Peter J., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Variable ratio transmission systems. 4,232,570, Cl. 74-866.000.
Gidge, Kenneth, to BSL Corporation. Pass-through weather curtain for garages and the like. 4,232,725, Cl. 160-332.000.
Giessler, Klaus: *See—*
Juntgen, Harald; Knoblauch, Karl; Degel, Josef; Zundorf, Dieter; and Giessler, Klaus, 4,233,117, Cl. 201-6.000.
Gigandet, Richard W.: *See—*
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Gilchrist, George E.: *See—*
Beeghly, Lester R.; and Gilchrist, George E., 4,232,406, Cl. 4-213.000.
Gilkeson, Robert F.; and Blose, John B. Supplemental energy register. 4,233,590, Cl. 340-870.040.
Gillette Company, The: *See—*
Lucas, Michael P., 4,232,785, Cl. 206-228.000.
Gingerich, David L., to Champion International Corporation. Envelope forming machine and method. 4,232,592, Cl. 493-10.000.
Gintert, Dean W., to PPG Industries, Inc. Removing fragments of fractured glass sheets during tempering. 4,233,048, Cl. 65-27.000.
Giordano, Giavelli. Machine and service truck assembly for loading, unloading and storing ceramic tiles. 4,232,987, Cl. 414-331.000.
Girling Limited: *See—*
Brearley, Malcolm, 4,233,599, Cl. 340-679.000.
Farr, Glyn P. R., 4,232,909, Cl. 303-22.00R.
Harries, David A., 4,232,520, Cl. 60-550.000.
Glab, Edwin F., to Xerox Corporation. Scanning system. 4,232,960, Cl. 355-8.000.
Glaxo Group Limited: *See—*
Martin-Smith, Michael; Price, Barry J.; Bradshaw, John; and Clitherow, John W., 4,233,302, Cl. 424-251.000.
Glenn, Ronnie D.; and Myers, Claude V., to G & M Enterprises, Inc. Bracket for elevating and lowering an outboard motor. 4,232,627, Cl. 440-61.000.
Go, Santos W.: *See—*
Brady, Thomas E.; and Go, Santos W., 4,233,022, Cl. 425-525.000.
Goffredo, Daniel L., to Chemcut Corporation. Method for ion control of solutions. 4,233,106, Cl. 156-627.000.
Goldshtein, Boris G.: *See—*
Antipov, Georgy A.; Gelfand, Mikhail L.; Goldshtein, Boris G.; Rutgaizer, Mikhail I.; Suut, Nikolai K.; Tsipenjuk, Yakov I.; Shishulin, Jury P.; Galimov, Apas G.; Sutyagin, Oleg Y.; and Yankovsky, Oleg A., 4,232,750, Cl. 173-93.600.
Goliasch, Karl: *See—*
Schroer, Horst; Goliasch, Karl; and Beck, Uwe, 4,233,233, Cl. 260-465.00E.
Goller, Glen J.; and Breault, Richard D., to United Technologies Corporation. Automated catalyst processing for cloud electrode fabrication for fuel cells. 4,233,181, Cl. 252-425.300.
Goodyear Tire & Rubber Company, The: *See—*
Gazuit, Georges, 4,232,723, Cl. 152-350.000.
Kuhar, George A., 4,233,416, Cl. 525-234.000.
Gordon, Gerald A.: *See—*
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Goren, Yoram; and Springett, Charles, to Sante Fe International Corporation. Column stabilized semisubmerged drilling vessel. 4,232,625, Cl. 114-264.000.
Gorondy, Emery J.: *See—*
Edwards, Donald W.; and Gorondy, Emery J., 4,233,382, Cl. 430-39.000.
Goteborgs Maskinkonsult AB: *See—*
Bergsand, Karl A., 4,233,084, Cl. 134-67.000.
Goto, Kenji: *See—*
Yamaguchi, Hiroaki; Hattori, Tadashi; Nishida, Minoru; Goto, Kenji; Sawada, Daisaku; and Shigematu, Takashi, 4,232,642, Cl. 123-416.000.
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Tsuchiya, Shozo; Hayashi, Hideo; Sasaki, Makoto; Goto, Kiyoshi; and Ihida, Kazuyoshi, 4,233,420, Cl. 525-310.000.
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DiMarco, Bernard; Clement, Ralph C.; and Parmenter, Charles W., 4,233,482, Cl. 200-163.000.
Geil, Ronald J., 4,232,702, Cl. 137-115.000.
Goyat, Eugene, to Goyat, Raymond, a part interest. Production of industrial electrical energy from hydraulic energy. 4,232,524, Cl. 60-647.000.
Goyat, Raymond: *See—*
Goyat, Eugene, 4,232,524, Cl. 60-647.000.
Grabowski, Edward J. J.: *See—*
Czaja, Robert F.; and Grabowski, Edward J. J., 4,233,457, Cl. 562-428.000.
Grachev, Konstantin A.; Berber, Viktor A.; Sokolov, Viktor E.; Pavlov, Vladimir V.; Popov, Alexei N.; and Zolotenko, Vladimir A. Instrument for measuring sizes and quantity of particles in fluid medium. 4,232,967, Cl. 356-336.000.
Grakauskas, Vytautos, to United States of America, Air Force. Method for the preparation of alkali metal salts of dinitromethane. 4,233,249, Cl. 568-926.000.
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Duprez, Daniel; and Grand, Michel, 4,233,186, Cl. 252-466.00B.
Grandchamp, Pierre-Andre, to Hoffmann-La Roche Inc. Particle size meter. 4,233,664, Cl. 364-555.000.
Grant, Louis A.: *See—*
Meyers, Leo J.; and Grant, Louis A., 4,233,119, Cl. 202-241.000.
Grant, Sidney. Processing of sheet material in a liquid bath. 4,232,691, Cl. 134-104.000.
Graphic Controls Corporation: *See—*
Hubbard, James R., 4,233,609, Cl. 346-140.00A.
Grass Valley Group, The: *See—*
Dayton, Birney D., 4,233,629, Cl. 358-153.000.
Grassi, Bruno: *See—*
Giacopelli, Umberto; Grassi, Bruno; and Crabbe, Rene, 4,233,147, Cl. 204-266.000.
Gray, Charles R.; Hazen, John O.; and Kelly, Charles J., to H. H. Robertson Company. Fire-resistant electrical wiring distributing floor structure and method. 4,232,493, Cl. 52-221.000.
Gray, Roy M. Instrument protecting and carrying structure. 4,232,808, Cl. 224-205.000.
Great Lakes Carbon Corporation: *See—*
Joo', Louis A.; and Miller, Frederick C., 4,233,378, Cl. 429-220.000.
Ramsey, David E.; and Grindstaff, Lloyd I., 4,233,148, Cl. 204-291.000.
Greber, Gerd: *See—*
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Green, Robert J.; and Hales, Gerald A., to Molins Limited. Emergency stop circuit monitoring system. 4,233,598, Cl. 340-652.000.
Greenbat, Limited: *See—*
Clokie, Andrew K., 4,232,714, Cl. 139-371.000.
Grenoble, Dane C.: *See—*
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Grianti, Francesco: *See—*
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Griffin, Warren R., to United States of America, Air Force. Channel sealant compositions. 4,233,426, Cl. 525-477.000.
Grill, Benjamin: *See—*
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Grimmer, Johannes: *See—*
Kilpper, Gerhard; and Grimmer, Johannes, 4,233,459, Cl. 562-458.000.
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Grimmer Schmidt Corp.: *See—*
Grimmer, John E.; and Donahue, Robert L., 4,232,997, Cl. 417-4.000.
Grindstaff, Lloyd I.: *See—*
Ramsey, David E.; and Grindstaff, Lloyd I., 4,233,148, Cl. 204-291.000.
Groeneweg, Willem H., to RCA Corporation. SECAM-PAL Converter. 4,233,622, Cl. 358-11.000.
Gross, Stephen E.; Cain, Clifford W., Jr.; Bilawsky, Paul D.; and Scheffel, Norman B., to Johns-Manville Corporation. Separator for starved electrolyte lead/acid battery. 4,233,379, Cl. 429-247.000.
Gruaz, Daniel: *See—*
Sicre, Jean-Luc; and Gruaz, Daniel, 4,232,839, Cl. 244-188.000.
Gruber, Bruce A.; and Lorenz, Donald H., to GAF Corporation. Copolymerizable, ultraviolet light absorber 4-acryloxybenzal-3-alkyl-2 N-benzothiazoloazines. 4,233,441, Cl. 542-419.000.
Gruber, Bruce A.; and Lorenz, Donald H., to GAF Corporation. Copolymerizable, ultraviolet light absorber 4-allyloxybenzal-3'-alkyl-2'-benzothiazoloazines. 4,233,442, Cl. 542-419.000.
Gruber, Roland F. Nozzle arrangement for encapsulating machines. 4,232,829, Cl. 239-433.000.
Grudkowski, Thomas W., to United Technologies Corporation. Carrier concentration controlled surface acoustic wave variable delay devices. 4,233,573, Cl. 331-107.00A.
Grudzinskas, Charles V.: *See—*
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Grumbach, Egon: *See—*
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Grumman Aerospace Corporation: *See—*
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Cohen, Murray, 4,232,978, Cl. 403-317.000.
Grummer, William L.; and Hendriks, Hendrik B., to General Electric Company. Capacitive touch switch array. 4,233,522, Cl. 307-116.000.
Grunder, Werner; and Murbach, Erwin, to Zellweger Uster Limited. Method and an apparatus for continuously monitoring the cross-section of slivers. 4,232,447, Cl. 33-147.00L.
Grundfos A/S: *See—*
Jensen, Axel; and Molgaard, Niels, 4,233,551, Cl. 318-809.000.

GTE Products Corporation: *See*—
Beaucamp, Claude, 4,233,581, Cl. 335-212.000.
Ritsko, Joseph E.; Culkin, John J.; MacInnis, Martin B.; and Acla, Howard L., 4,233,063, Cl. 75-0.5AA.
Waymouth, John F.; Passmore, Edmund M.; and Duggan, George L., 4,233,536, Cl. 313-174.000.

Gundlach, John A., to Everett Metal Products. Shaker mechanism for a stack of sieve trays. 4,233,151, Cl. 209-319.000.

Gunti, Rolf, to Masyc A.G. Set of components for producing variable load-bearing scaffolds. 4,232,774, Cl. 193-35.00J.

Gureghian, Richard S.: *See*—
Peterson, Robert R.; Ventura, Daniel S.; and Gureghian, Richard S., 4,232,563, Cl. 74-470.000.

Gute, Manfred: *See*—
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Gutman, Rodika: *See*—
Kraus, Menahem A.; Frommer, Moshe A.; Nemas, Mara; and Gutman, Rodika, 4,233,434, Cl. 528-337.000.

H. H. Robertson Company: *See*—
Gray, Charles R.; Hazen, John O.; and Kelly, Charles J., 4,232,493, Cl. 52-221.000.

Haddon, Merrill K.; and Moulton, Clifford H. Automatic impedance matching conduit locator. 4,233,561, Cl. 324-326.000.

Haering, Rudolph R.; and Stiles, James A. R. Electrical storage device. 4,233,377, Cl. 429-218.000.

Hagen, Reinold, to Kautex-Maschinenbau, GmbH. Apparatus for separation of waste material from a moulded article. 4,233,009, Cl. 425-142.000.

Hagner, Willi; and Frimmel, Horst, to Ernst Leitz Wetzlar GmbH. Brightness control for fiber optical lamps. 4,233,650, Cl. 362-32.000.

Hahn, Joachim, to VDO Adolf Schindling AG. Console for holding nautical indicators. 4,232,915, Cl. 312-107.000.

Hahn, Volker; and Fastenau, Werner, to Ed. Zublin Aktiengesellschaft. Method of and arrangement for correcting the height of railway upper structures. 4,232,822, Cl. 238-7.000.

Hait, James M., to FMC Corporation. Automatic rotary irrigation system. 4,232,705, Cl. 137-899.100.

Hales, Gerald A.: *See*—
Green, Robert J.; and Hales, Gerald A., 4,233,598, Cl. 340-652.000.

Hall, Floyd V., to Liggett Group Inc. Apparatus and method for providing a cigarette filter with an aeration groove. 4,232,574, Cl. 82-84.000.

Hall, Richard H.: *See*—
Lamson, Junior J.; Hall, Richard H.; Stroiwas, Edward; and Yats, Larry D., 4,233,467, Cl. 585-437.000.

Hallam, Keith J.; and Marsden, Dennis B., to Pullman Incorporated. Car coupling arrangement for railway passenger cars. 4,232,793, Cl. 213-43.000.

Haller, Ingo: *See*—
Kramer, Wolfgang; Buchel, Karl H.; Plempel, Manfred; and Haller, Ingo, 4,233,311, Cl. 424-273.00R.

Halliburton Company: *See*—
Carney, Leroy L., 4,233,162, Cl. 252-8.50C.
Cox, Bruce M., 4,233,000, Cl. 417-402.000.

Hamann, Arnold: *See*—
Scheer, Peter; and Hamann, Arnold, 4,233,649, Cl. 362-32.000.

Hamerdinger, Randolph W.; and McQuillan, Robert C., to Xerox Corporation. Laser tube mirror assembly. 4,233,568, Cl. 331-94.50D.

Hamm, Norbert: *See*—
Breig, Kurt; Dehmel, Georg; and Hamm, Norbert, 4,233,213, Cl. 260-141.000.

Hammann, Ingeborg: *See*—
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Maurer, Fritz; Hammann, Ingeborg; and Behrenz, Wolfgang, 4,233,294, Cl. 424-200.000.

Hammel, Harold T.; and Maggert, James E., to University of California, The Regents of the. Continuous method and apparatus for separating solvent from solute. 4,233,153, Cl. 203-10.000.

Hammel, Richard L.; Schaefer, Robert H.; Lancia, Frederick N.; Wolfe, William A.; Dearth, Leonard F.; Benton, Stephen L.; Homan, H. Richard; and Bruce, Arthur P., to Kroger Company, The. Automatic vending machine for delivering containers having edible product therein. 4,232,798, Cl. 221-12.000.

Hammer, Ganz G., Jr., to General Motors Corporation. Method for making an air cooled combustor. 4,233,123, Cl. 204-129.650.

Hammer, Klaus-Dieter; Gerigk, Gunter; and Klendauer, Wolfgang, to Hoechst Aktiengesellschaft. Process for preparing packaging material suitable for sausage casings and articles manufactured therefrom. 4,233,341, Cl. 427-230.000.

Hammitt, Frederick G.: *See*—
Gallo, Donald J.; Roscetti, Thomas L.; Emslie, Alan E.; and Hammitt, Frederick G., 4,232,710, Cl. 138-39.000.

Hampel, Wilbur J.: *See*—
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Hamworthy Engineering Limited: *See*—
Hawkes, Dennis L.; Horton, Rex; and Stafford, David A., 4,233,155, Cl. 210-92.000.

Hanaya, Morimasa, to Toyo Pulp Co., Limited. Round log material and method of producing the same. 4,232,720, Cl. 144-309.0AC.

Hankins, Harold C. A.; Hughes, Gordon; and Laker, Robert W., to International Computers Limited. Display system. 4,233,601, Cl. 340-703.000.

Hanley, William F. Portable stage. 4,232,488, Cl. 52-7.000.

Hanmura, Hisao, to Hitachi, Ltd. Multi-matrix display system having matrix display panel with uncrossed connections on substrates. 4,233,602, Cl. 340-752.000.

Hans Grohe GmbH & Co. KG: *See*—
Stahl, Eugen H., 4,233,097, Cl. 156-143.000.

Hansen, Kenneth A.: *See*—
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Hara, Hiroshi: *See*—
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Harada, Makoto: *See*—
Eguchi, Wataru; Harada, Makoto; Tanigaki, Masataka; and Tada, Yutaka, 4,232,543, Cl. 73-15.00A.

Harada, Masahide; and Mochizuki, Manabu, to Ricoh Company, Ltd. Scorotron charging apparatus. 4,233,511, Cl. 250-325.000.

Harada, Tooru; and Fujita, Shinsaku, to Fuji Photo Film Co., Ltd. 2-Alkoxyalkoxy-5-aminobenzenesulfonic acid. 4,233,237, Cl. 260-509.000.

Haraka, Wayne: *See*—
Kolk, Glenn R.; and Haraka, Wayne, 4,232,471, Cl. 43-44.990.

Harbaugh, Steven K.; and Hoogerbrugge, Gary H., to Eocom Corporation. Optical read-write system with electronically variable image size. 4,233,636, Cl. 358-287.000.

Harder, Hans E.: *See*—
Richter, Karl M.; Harder, Hans E.; and Behrens, Klaus, 4,232,670, Cl. 128-224.000.

Harmon, George L.; Monroe, Ronald D.; Munday, Thomas M.; Jones, Clarence E.; and Baker, Edward B., to Martin Marietta Corporation. Weapons system simulator and method including ranging system. 4,232,456, Cl. 35-25.000.

Harper, Leslie R.: *See*—
Lewis, William J.; Harper, Leslie R.; Davis, Malcolm J.; and Gardiner, Richard G., 4,232,516, Cl. 60-226.00A.

Harries, David A., to Girling Limited. Actuator assemblies for vehicle hydraulic braking systems. 4,232,520, Cl. 60-550.000.

Harrington, Elaine M.; and Menning, Paul C. Adjustable ottoman. 4,232,901, Cl. 297-439.000.

Harris Corporation: *See*—
McRae, Daniel D., 4,233,683, Cl. 375-14.000.
Pelchat, Guy M., 4,233,576, Cl. 333-16.000.

Harris, Jeffrey J.; and Wood, Colin E. C., to U.S. Philips Corporation. Utilizing lead compounds of sulphur, selenium and tellurium as dopant sources. 4,233,092, Cl. 148-175.000.

Harris, Robert F.: *See*—
Tefertiller, Nancy B.; Burdett, Kenneth A.; and Harris, Robert F., 4,233,425, Cl. 525-455.000.

Harrison, Donald G. Firearm with recoil movement delaying mechanism. 4,232,583, Cl. 89-153.000.

Harrold, Milton C.: *See*—
Welling, Conrad G.; Davenport, Gordon H.; Reichert, Guenter; Snyder, Charles M.; Harrold, Milton C.; Donze, Salvatore H.; and Larsen, Frank R., 4,232,903, Cl. 299-8.000.

Hart, Donald R.: *See*—
Northup, Francis B.; and Hart, Donald R., 4,232,507, Cl. 57-16.000.

Hartig, Juergen: *See*—
Weitz, Hans-Martin; Hartig, Juergen; and Marosi, Laszlo, 4,233,455, Cl. 560-244.000.

Hartl, Johann, to Voest-Alpine Aktiengesellschaft. Tap-hole closing arrangement. 4,232,855, Cl. 266-272.000.

Hartmann, Werner, to Harwe AG. Process for producing molded articles from polylauryllactam activated anionic polymerization. 4,233,433, Cl. 528-326.000.

Hartung, Kuhn & Co. Maschinenfabrik GmbH: *See*—
Riecker, Johann G.; and Schroter, Horst, 4,233,118, Cl. 202-230.000.

Haruna, Tohru: *See*—
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Harwe AG: *See*—
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Hascoe, Norman, to Semi-Alloys, Inc. Method and apparatus for fabricating a sealing cover unit for a container for a semiconductor device. 4,232,814, Cl. 228-173.00E.

Hasegawa, Kinji; Mitsuishi, Yukio; and Masuda, Shigeyoshi, to Teijin Limited. Printed polyester films. 4,233,354, Cl. 428-195.000.

Hasegawa, Yuji: *See*—
Aizawa, Tatsuo; Kozuka, Nobuhiko; and Hasegawa, Yuji, 4,233,386, Cl. 430-125.000.

Hashimoto, Akihiko; and Koiwai, Tamotsu, to Olympus Optical Co., Ltd. Data recordable camera. 4,232,956, Cl. 354-106.000.

Hashimoto, Noritsugu, to Hitachi Maxell, Ltd. Magnetic recording tape cassette. 4,232,841, Cl. 242-199.000.

Hashimoto, Takashi: *See*—
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Hatje, Erich; and Reinert, Norbert, to Buehler-Miag GmbH. Trickler heat-exchange apparatus. 4,232,734, Cl. 165-118.000.

Hattori, Tadashi: *See*—
Yamaguchi, Hiroaki; Hattori, Tadashi; Nishida, Minoru; Goto, Kenji; Sawada, Daisaku; and Shigematu, Takashi, 4,232,642, Cl. 123-416.000.

Hauk, Ernest D.; and Kirkpatrick, Jesse C., to Service Equipment Design Co., Inc. Method and apparatus for driving pipe. 4,232,752, Cl. 175-135.000.

Hausberger, Arthur L.; and Dienes, Edward K., to United Catalysts Inc. Process for the conversion of carbon monoxide. 4,233,180, Cl. 252-373.000.

Hauser, Hans; and Clayborne, William J., to J. B. Foote Foundry Co., The. Transaxle. 4,232,569, Cl. 74-701.000.

Havstad, Harold R.: *See—*
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Hawkes, Dennis L.; Horton, Rex; and Stafford, David A., to Hamworthy Engineering Limited. Apparatuses for the anaerobic digestion of natural organic waste. 4,233,155, Cl. 210-92.000.

Hawrylo, Frank Z.; and Kressel, Henry, to RCA Corporation. Method of making a laser diode. 4,233,090, Cl. 148-171.000.

Hayashi, Hideo: *See—*
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Hayashi, Hiroshi: *See—*
Sato, Haruhito; Ichikawa, Hiroshi; Hayashi, Hiroshi; and Kurisaki, Konomu, 4,233,161, Cl. 252-1.000.

Hazel, John G., to PPG Industries, Inc. Preparing extrudable refractory hard metal-wax blends. 4,233,077, Cl. 106-43.000.

Hazeltine Corporation: *See—*
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Hazen, John O.: *See—*
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Hazerdonk, Teunis J.: *See—*
Bouwhuis, Gijsbertus; and Hazerdonk, Teunis J., 4,233,502, Cl. 250-204.000.

Heath, Ronald A.: *See—*
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Heatherbourne Plastics Limited: *See—*
Meyler-Warlow, Ian; and Law, Graham H., 4,233,373, Cl. 429-181.000.

Heckles, John S., to Armstrong Cork Company. Ureadiacetoacetamido compounds. 4,233,239, Cl. 564-57.000.

Heenan, Sidney A.: *See—*
Johnson, Glenn W., Jr.; and Heenan, Sidney A., 4,232,979, Cl. 404-16.000.

Heiser, Joseph I.; and Erb, Edgar M., to General Battery Corporation. Snap-through anti-ignition vent cap for lead acid storage batteries. 4,233,370, Cl. 429-82.000.

Helbert, John N., to United States of America, Army. Method of patterning a substrate. 4,233,394, Cl. 430-270.000.

Held, Manfred, to Messerschmitt-Bolkow-Blohm GmbH. Proximity fuse. 4,232,609, Cl. 102-214.000.

Hendriks, Hendrik B.: *See—*
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Henkel Kommanditgesellschaft auf Aktien (Henkel KGAA): *See—*
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Hentschel, Bernhard: *See—*
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Herczog, Andrew, to Corning Glass Works. Surgical cutting instrument. 4,232,676, Cl. 128-303.140.

Hernandez, Rafael J.: *See—*
Weierman, Robert J.; Merle, Joseph J.; Gordon, Gerald A.; Pan, Peter N. Y.; and Hernandez, Rafael J., 4,232,622, Cl. 113-121.00C.

Herrington, Richard A.: *See—*
Boehm, Hans W.; Herrington, Richard A.; and Oelke, Waldemar W., 4,232,809, Cl. 225-93.500.

Hesselgren, Sven-Gunnar. Stand for instruments for medical use. 4,232,784, Cl. 206-210.000.

Heusser, Dietrich; and Dingeldein, Elvira, to Merck Patent Gesellschaft mit beschrankter Haftung. Synthetic resin-base, antibiotic compositions containing amino acids. 4,233,287, Cl. 424-14.000.

Hewlett-Packard Company: *See—*
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Hibi, Susumu: *See—*
Yamaguchi, Nakahiko; Hibi, Susumu; Yoshizawa, Shigeru; Yoshimoto, Shoji; and Kobayashi, Akira, 4,233,668, Cl. 365-1.000.

Hickok, Robert L., to General Electric Company. Internal shunt for series connected lamps. 4,233,543, Cl. 315-75.000.

Hill, John A.; Wang, Yu-chang J.; and Wong, Thomas M., to E. R. Squibb & Sons, Inc. Corticosteroid formulations containing sebacate carrier. 4,233,295, Cl. 424-238.000.

Hill, Robert C.; Nielson, Niel E.; Kreiling, Ronald L.; and Nice, Ralph A., to Atlantic Richfield Company. Apparatus and method for the treatment of liquors. 4,233,152, Cl. 210-703.000.

Hilliard, Garland E.: *See—*
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Hillside Engineering, Inc.: *See—*
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Himmelmann, Wolfgang: *See—*
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Hinderling, Jurg: *See—*
Hinn, Werner; and Hinderling, Jurg, 4,233,624, Cl. 358-65.000.

Hinn, Werner; and Hinderling, Jurg, to RCA Corporation. Combined kinescope grid and cathode video drive system. 4,233,624, Cl. 358-65.000.

Hinz, Hans-Dieter; Rothgordt, Ulf; and Schinke, Franz, to U.S. Philips Corporation. Method and apparatus for liquid electrostatic development of charge images on a tape-like record carrier. 4,233,385, Cl. 430-117.000.

Hirai, Tadaaki: *See—*
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Hirayama, Kazuhiro; Sato, Yasushi; Tokiwa, Taisuke; Kawakubo, Kazuo; Iwatate, Fujio; and Nakatsui, Hisashi, to Canon Kabushiki Kaisha. Image information electrostatic recording device. 4,233,612, Cl. 346-160.000.

Hirayama, Kazuhiro: *See—*
Kitamura, Takashi; Watanabe, Asao; Nakano, Takashi; Masaki, Katsumi; Hirayama, Kazuhiro; Sato, Yasushi; and Tokiwa, Taisuke, 4,232,954, Cl. 354-7.000.

Hirko, Ronald J.; and Mills, Harold E., to Occidental Chemical Company. Recovery of hydrogen fluoride from metallic fluoride salts. 4,233,281, Cl. 423-484.000.

Hishinuma, Esao; Tomimori, Akinobu; and Hara, Hiroshi, to Nippon Electric Co., Ltd. Telephone transmitter amplifier. 4,233,474, Cl. 179-81.00B.

Hitachi Chemical Company, Ltd.: *See—*
Monma, Noboru; Maekawa, Iwao; Sarudate, Tutomu; Sato, Hidetaka; and Uchigasaki, Isao, 4,233,413, Cl. 525-168.000.

Hitachi, Ltd.: *See—*
Abe, Masayuki; and Fujihira, Yuji, 4,233,582, Cl. 335-213.000.
Akiyama, Toshiyuki, 4,233,632, Cl. 358-212.000.
Furukawa, Kazuo; and Furukawa, Sumio, 4,233,669, Cl. 365-15.000.
Hanmura, Hisao, 4,233,602, Cl. 340-752.000.
Ikeda, Tadasu; and Taki, Takamitsu, 4,232,993, Cl. 415-103.000.
Kaneko, Kenji; and Okabe, Takahiro, 4,233,574, Cl. 331-108.00D.
Kimura, Shoichi; Takahashi, Toshihiko; and Tamura, Zensuke, 4,233,275, Cl. 423-230.000.
Murata, Toshinori; Matsuura, Shigeo; Miyamoto, Hiroshi; and Akutsu, Eisaku, 4,233,591, Cl. 340-347.0DA.
Sato, Seisiro, 4,233,510, Cl. 250-311.000.
Sugimoto, Shun-ichiro; and Shinoki, Hisazi, 4,233,585, Cl. 335-262.000.
Tamura, Hifumi; and Ishitani, Tohru, 4,233,509, Cl. 250-306.000.
Tsuji, Koh, 4,232,994, Cl. 415-127.000.
Tsukada, Katsuo; and Ohnuma, Sadabumi, 4,233,156, Cl. 210-101.000.
Yamaguchi, Nakahiko; Hibi, Susumu; Yoshizawa, Shigeru; Yoshimoto, Shoji; and Kobayashi, Akira, 4,233,668, Cl. 365-1.000.
Yamamoto, Hideaki; Matsui, Makoto; Tsukada, Toshihisa; Eto, Yoshizumi; Hirai, Tadaaki; and Maruyama, Eiichi, 4,233,506, Cl. 250-227.000.

Hitachi Maxell, Ltd.: *See—*
Hashimoto, Noritsugu, 4,232,841, Cl. 242-199.000.

Hitachi Shipbuilding & Engineering Co., Ltd.: *See—*
Inaba, Hideya; Nagai, Kenichi; Kamino, Yasumi; and Maeda, Kazuo, 4,233,183, Cl. 252-432.000.

Hitchinson, Patrick W.: *See—*
Hurlow, Gerald S.; Blain, Jean R.; Coombes, Michael; Richard, Jean-Claude; and Hitchinson, Patrick W., 4,232,598, Cl. 99-483.000.

Hitschfel, Gerhard; Jurges, Peter; and Munk, Rudolf, to Hoechst Aktiengesellschaft. Reducing grinding time and compositions therefor. 4,233,026, Cl. 8-52.000.

Hobbs, Howard F., to Variable Kinetic Drives Limited. Power transmission apparatus. 4,232,567, Cl. 74-677.000.

Hoberg, Heinz; and Klein, Albert, to Bergwerksverband GmbH. Quickly performed measuring method for ascertaining the concentration of the polar components in a material otherwise mainly nonpolar. 4,233,559, Cl. 324-58.50A.

Hochhauser, Arthur M.: *See—*
Chin, Joseph T.; Hochhauser, Arthur M.; and McCarthy, John P., 4,233,016, Cl. 425-288.000.

Hochiki Corporation: *See—*
Takeuchi, Takeshi; and Terasawa, Takao, 4,232,931, Cl. 339-258.00R.
Tanigawa, Takeshi; and Yamauchi, Yukio, 4,233,594, Cl. 340-525.000.

Hochreuter, Richard; and Runyon, James R., to Sandoz Ltd. Salts of polymeric basic amides. 4,233,193, Cl. 260-18.00N.

Hock, Jules M. Ring spring for composite machinery seals and method of manufacturing same. 4,232,873, Cl. 277-206.00A.

Hoechst Aktiengesellschaft: *See—*
Hammer, Klaus-Dieter; Gerigk, Gunter; and Klendauer, Wolfgang, 4,233,341, Cl. 427-230.000.
Hitschfel, Gerhard; Jurges, Peter; and Munk, Rudolf, 4,233,026, Cl. 8-52.000.
Klupfel, Kurt; and Sprengel, Heide, 4,233,395, Cl. 430-271.000.
Moraw, Roland; and Schadlich, Gunther, 4,233,380, Cl. 430-2.000.
Nolken, Ernst, 4,233,198, Cl. 260-29.6MP.

Hoehn, Hans: *See—*
Denzel, Theodor; and Hoehn, Hans, 4,233,300, Cl. 424-248.400.

Hoen, Cuyler, to Simmons Fastener Corporation. Fastener with camming handle. 4,232,890, Cl. 292-114.000.

Hoerauf, Werner; Valentin, Guenter; Kegel, Robert; and Kuhn, Helmut, to BASF Aktiengesellschaft. Process for removing volatiles evolved from plastic melts. 4,233,429, Cl. 526-71.000.

Hof, Craig R.; and Ulin, Roy A., to Akzona Incorporated. Temperature indicating compositions of matter. 4,232,552, Cl. 73-356.000.

Hoff, Glen R.; and Fotis, Peter, to Standard Oil Company (Indiana). High activity catalyst for the polymerization of alpha-olefins. 4,233,182, Cl. 252-429.00C.

Hoff, Glen R.; and Fotis, Peter, to Standard Oil Company (Indiana). Method for the preparation of metal salts of phosphorus acid esters. 4,233,253, Cl. 260-987.000.

Hoffmann-La Roche Inc.: *See*—
Grandchamp, Pierre-Andre, 4,233,664, Cl. 364-555.000.

Hoffmann, Otto-Horst: *See*—
Aichert, Hans; Dietrich, Walter; Hoffmann, Otto-Horst; Stark, Friedrich; and Stephan, Herbert, 4,233,342, Cl. 427-251.000.

Hoffmann, Werner: *See*—
Baumann, Manfred; and Hoffmann, Werner, 4,233,464, Cl. 568-591.000.

Hogeboom, John G., to Northern Telecom Limited. Sample-and-hold circuit with current gain. 4,233,528, Cl. 307-353.000.

Hokby, Nils: *See*—
Kimber, Erich V.; and Hokby, Nils, 4,232,850, Cl. 248-654.000.

Holick, Hubert: *See*—
Rohr, Franz-Josef; and Holick, Hubert, 4,233,142, Cl. 204-195.00S.

Holiday, Anne. Food packaging. 4,232,787, Cl. 206-443.000.

Hollick, John G., to USM Corporation. Machine for stiffening and forming sheet material. 4,232,418, Cl. 12-61.00A.

Holstein, John H., to Holstein, John H. Capper chuck. 4,232,499, Cl. 53-331.500.

Holstein, John H., to Holstein, John H. Roll-on capper chuck. 4,232,500, Cl. 53-334.000.

Holtman, Dennis C.: *See*—
Elias, Robert T.; and Holtman, Dennis C., 4,233,345, Cl. 427-325.000.

Holub, Fred F.: *See*—
Abolins, Visvaldis; Holub, Fred F.; and Shenian, Popkin R., 4,233,199, Cl. 260-30.60R.

Homan, H. Richard: *See*—
Hammel, Richard L.; Schaefer, Robert H.; Lancia, Frederick N.; Wolfe, William A.; Dearth, Leonard F.; Benton, Stephen L.; Homan, H. Richard; and Bruce, Arthur P., 4,232,798, Cl. 221-12.000.

Honeycutt, John D.: *See*—
Smith, Jimmie L.; Honeycutt, John D.; and Dobie, Michael J., 4,232,777, Cl. 198-404.000.

Honeywell Inc.: *See*—
Mueller, Dale A., 4,232,530, Cl. 62-160.000.
White, Bob B., 4,232,716, Cl. 141-98.000.

Honnen, Lewis R.: *See*—
Lewis, Robert A.; and Honnen, Lewis R., 4,233,168, Cl. 252-51.50A.

Hoogerbrugge, Gary H.: *See*—
Harbaugh, Steven K.; and Hoogerbrugge, Gary H., 4,233,636, Cl. 358-287.000.

Hooker Chemicals & Plastics Corp.: *See*—
Baumgardt, Walter G.; Ondesko, John J.; and Zysman, Bernard K., 4,233,203, Cl. 260-38.000.

Hoover, Troy E.: *See*—
Becker, William J.; Farber, Sheldon; and Hoover, Troy E., 4,232,887, Cl. 282-27.500.

Hopeman Brothers, Inc.: *See*—
Shiflet, Frank L., 4,233,350, Cl. 428-110.000.

Hopper, George O., Jr.: *See*—
Martin, Dennis R.; and Hopper, George O., Jr., 4,232,800, Cl. 221-109.000.

Horgan, Anthony M., to Xerox Corporation. Trigonal selenium photoconductive element. 4,233,383, Cl. 430-58.000.

Horian, James G.: *See*—
Horian, Richard C.; and Horian, James G., 4,232,871, Cl. 274-47.000.

Horian, Richard C.; and Horian, James G. Manual record cleaner. 4,232,871, Cl. 274-47.000.

Horiba, Ltd.: *See*—
Maruyama, Hiroshi; and Watanabe, Masashi, 4,233,257, Cl. 264-113.000.

Horikawa, Yukio: *See*—
Ohtomo, Koichiro; and Horikawa, Yukio, 4,233,211, Cl. 260-123.700.
Otoi, Kiyoshi; and Horikawa, Yukio, 4,233,212, Cl. 260-123.700.

Horler, Hansulrich: *See*—
Croes, Nicolaus; Horler, Hansulrich; and Kirchhofer, Hubert, 4,232,999, Cl. 417-64.000.

Horn, John M.: *See*—
Sample, Thomas E., Jr.; and Horn, John M., 4,233,366, Cl. 428-405.000.

Horn, Ulrich: *See*—
Koller, Josef; Horn, Ulrich; Moser, Peter; Motter, Manfred; and Galafassi, Pierre, 4,233,028, Cl. 8-534.000.

Horton, Rex: *See*—
Hawkes, Dennis L.; Horton, Rex; and Stafford, David A., 4,233,155, Cl. 210-92.000.

Hosoda, Tadashi: *See*—
Toda, Kazuo; Hosoda, Tadashi; and Matsuo, Yutaka, 4,233,149, Cl. 204-297.00W.

Hosoi, Hideo: *See*—
Fujishima, Rikio; Nishihara, Kunisuke; and Hosoi, Hideo, 4,233,104, Cl. 156-504.000.

Hosoi, Takuji: *See*—
Ozaki, Kiyoji; Fukuhara, Akinobu; Hosoi, Takuji; and Sagi, Yasuo, 4,233,137, Cl. 208-48.00Q.

Hosterman, Craig; and Kerwin, William J., to Products of Advanced Technology, Inc. Pressure relief valve with pressure indicating means. 4,232,698, Cl. 137-68.00R.

Housman, Richard W. Low profile display. 4,232,799, Cl. 221-92.000.

Houssian, Vazgen J.: *See*—
Dowzall, Martin E.; and Houssian, Vazgen J., 4,232,452, Cl. 33-430.000.

Howard, Fred. Waterfall carpet display. 4,232,791, Cl. 211-47.000.

Howarth, Michael S., to Imperial Chemical Industries Limited. Manufacture of esters. 4,233,232, Cl. 260-465.00D.

Howell, John K., Jr., to Oxy Metal Industries Corporation. Waterborne coating for metal surfaces. 4,233,197, Cl. 260-29.40R.

Howes, David R., Executor: *See*—
Ledig, Kurt W., deceased; and Howes, David R., Executor, 4,233,445, Cl. 544-250.000.

Howmedica International, Inc. Zweigniederlassung: *See*—
Richter, Karl M.; Harder, Hans E.; and Behrens, Klaus, 4,232,670, Cl. 128-224.000.

Hruda, Robert M., to Westinghouse Electric Corp. Low voltage vacuum switch with three internal contacts including a center floating contact. 4,233,480, Cl. 200-144.00B.

Hsu, William W., to Textron Inc. Hydro-mechanical failure detection and latching apparatus. 4,232,699, Cl. 137-87.000.

Hubbard, James R., to Graphic Controls Corporation. Disposable instrument pen with integral spring member. 4,233,609, Cl. 346-140.00A.

Hubele, Adolf: *See*—
Kunz, Walter; Eckhardt, Wolfgang; and Hubele, Adolf, 4,233,308, Cl. 424-279.000.

Huchler, Otto H.: *See*—
Mueller, Herbert; and Huchler, Otto H., 4,233,228, Cl. 260-346.110.

Hudleson, Bruce D.; and Mahnke, Joachim F. Apparatus and method for transcutaneous electrotherapy nerve stimulator. 4,232 [illegible] Cl. 128-422.000.

Hudson Oxygen Therapy Sales Company: *See*—
Bartholomew, Victor L.; and Havstad, Harold R., 4,232,683, Cl. 128-725.000.

Hudson, Sharon J., Jr.; and Petersen, Karl T., to Sharon Manufacturing Company. Thermal release plug for a fabricated pressure vessel. 4,232,796, Cl. 220-89.00B.

Huffman, William A., to Minnesota Mining and Manufacturing Company. Liquid crystal compositions containing pleochroic dye. 4,232,949, Cl. 350-349.000.

Hughes Aircraft Company: *See*—
Lim, Hong S.; Rogers, Howard H.; and Verzwyvelt, Scott A., 4,233,347, Cl. 427-352.000.
Wang, Victor; and Yariv, Amnon, 4,233,571, Cl. 331-94.50C.

Hughes, Gordon: *See*—
Hankins, Harold C. A.; Hughes, Gordon; and Laker, Robert W., 4,233,601, Cl. 340-703.000.

Huin, Roland: *See*—
Boret, Roger; Bronner, Charles; Huin, Roland; and Vidal, Andre, 4,233,268, Cl. 422-190.000.

Hunter Engineering Company: *See*—
Lewis, William R.; and Smith, Dennis M., 4,232,804, Cl. 222-591.000.

Huntington Alloys Inc.: *See*—
Siddall, Richard J., 4,233,062, Cl. 75-0.50C.

Hurd, Robert L. Method and apparatus for deep mining using chain driven in fixed direction. 4,232,904, Cl. 299-18.000.

Hurlow, Gerald S.; Blain, Jean R.; Coombes, Michael; Richard, Jean-Claude; and Hitchinson, Patrick W., to General Foods Limited. Apparatus for the dearomatization of coffee oil. 4,232,598, Cl. 99-483.000.

Husges, Gerd; and Karl, Rupert, to Schubert & Salzer. Knotting mechanism provided with a driving mechanism. 4,232,508, Cl. 57-22.000.

Hwang, Un-Pah; and Simons, Robert E., to International Business Machines Corporation. Dual-pull air cooling for a computer frame. 4,233,644, Cl. 361-384.000.

Hyakumura, Kazushi, to Olympus Optical Co., Ltd. Photographic camera lens system having a short total length. 4,232,945, Cl. 350-223.000.

Hydro-Quebec: *See*—
Berthiaume, Raymond, 4,233,546, Cl. 315-241.00R.

Hydronic Systems, Inc: *See*—
Sturman, Oded E.; and Grill, Benjamin, 4,232,707, Cl. 137-624.200.

Ichikawa, Hiroshi: *See*—
Sato, Haruhito; Ichikawa, Hiroshi; Hayashi, Hiroshi; and Kurisaki, Konomu, 4,233,161, Cl. 252-1.000.

Ichikawa, Singo: *See*—
Yoshikawa, Kenichi; Koshikawa, Makoto; Umemoto, Toshio; Satoh, Tetsuo; Ichikawa, Singo; and Kato, Yoshiaki, 4,232,512, Cl. 368-82.000.

Idel, Karsten; Vernaleken, Hugo; Freitag, Dieter; Reiff, Gunther; and Rudolph, Hans, to Bayer Aktiengesellschaft. Polycondensates containing hydroxyquinoline end groups, their use for the preparation of polymers containing metals and metal containing polycondensates. 4,233,431, Cl. 525-462.000.

Idemitsu Kosan Company Limited: *See*—
Sato, Haruhito; Ichikawa, Hiroshi; Hayashi, Hiroshi; and Kurisaki, Konomu, 4,233,161, Cl. 252-1.000.

IEC-Holden Ltd.: *See*—
Winsor, Robert B., 4,232,612, Cl. 105-423.000.

Iemenschot, Johannes A., to U.S. Philips Corporation. Clamping device for a rotatable information carrying record. 4,232,870, Cl. 274-39.00R.

Ihida, Kazuyoshi: *See*—
Tsuchiya, Shozo; Hayashi, Hideo; Sasaki, Makoto; Goto, Kiyoshi; and Ihida, Kazuyoshi, 4,233,420, Cl. 525-310.000.
Ii, Motohiko: *See*—
Genjida, Fumihide; Nasuno, Toyoaki; Kobayashi, Hideo; and Ii, Motohiko, 4,233,170, Cl. 252-73.000.
Ikeda, Isamu. Moving coil type cartridge. 4,233,476, Cl. 179-100.41D.
Ikeda, Satoshi; and Shibata, Kouhei, to Shinko Kiko Co., Ltd. Continuous conveyance system. 4,232,782, Cl. 198-706.000.
Ikeda, Tadasu; and Taki, Takamitsu, to Hitachi, Ltd. Low pressure casing for a steam turbine. 4,232,993, Cl. 415-103.000.
Ikemori, Keiji, to Canon Kabushiki Kaisha. Optically compensated zoom lens. 4,232,942, Cl. 350-184.000.
Imada, Kiyoshi: *See*—
Asai, Michihiko; Suda, Yoshio; Imada, Kiyoshi; Ueno, Susumu; and Nomura, Hirokazu, 4,233,419, Cl. 525-288.000.
Imai, Toshihiro, to Olympus Optical Co., Ltd. Standard photographic lens. 4,232,944, Cl. 350-222.000.
Immel, Otto; and Schwarz, Hans-Helmut, to Bayer Aktiengesellschaft. Process for the preparation of 2,2-dimethylolalkanals. 4,233,247, Cl. 568-464.000.
Imperial Chemical Industries Limited: *See*—
Armstrong, Colin; and Walbridge, Derek J., 4,233,396, Cl. 430-320.000.
Blythe, Anthony R., 4,233,562, Cl. 324-455.000.
Cooke, Brian A., 4,233,087, Cl. 148-6.15Z.
Howarth, Michael S., 4,233,232, Cl. 260-465.00D.
Mallion, Keith B., 4,233,454, Cl. 560-122.000.
Inaba, Hideya; Nagai, Kenichi; Kamino, Yasumi; and Maeda, Kazuo, to Hitachi Shipbuilding & Engineering Co., Ltd. Process for producing plate-shaped denitrating catalyst. 4,233,183, Cl. 252-432.000.
Incom International Inc.: *See*—
Tao, Ting C., 4,233,042, Cl. 55-482.000.
Indian Explosives Limited: *See*—
Ghosh, Bidhan C.; Chopra, Gopal M.; and Sen, Soumendra N., 4,233,095, Cl. 149-95.000.
Industria Espanola de Manufacturas Especiales, S.A.: *See*—
Miro, Juan C., 4,232,769, Cl. 192-4.00R.
Ing. C. Olivetti & C., S.p.A.: *See*—
Bernardis, Francesco; and Prevignano, Paolo, 4,232,976, Cl. 400-196.100.
Ingenieursbureau Marcon (Marine Consultants) B.V.: *See*—
Wipkink, Johannes, 4,232,624, Cl. 114-257.000.
Ingram, Jocely P.; Kassat, Harry; and Kolenda, Herbert, to South African Coal, Oil & Gas Corp., Limited; and Gea Luftkuehlergesellschaft Happel GmbH & Co. Air-cooled heat exchanger for cooling industrial liquids. 4,232,729, Cl. 165-39.000.
Innovative Chemicals, Inc.: *See*—
Garcia, Robert I., 4,233,126, Cl. 204-157.10H.
Inoue-Japax Research Incorporated: *See*—
Inoue, Kiyoshi, 4,233,486, Cl. 219-69.00W.
Inoue, Kiyoshi, to Inoue-Japax Research Incorporated. Traveling-wire electrical discharge machine. 4,233,486, Cl. 219-69.00W.
Inoue, Michihiro: *See*—
Takemoto, Toyoki; Komeda, Tadao; Yamada, Haruyasu; and Inoue, Michihiro, 4,233,615, Cl. 357-22.000.
Inouye, Hiromasa; Kato, Matsuo; and Ito, Hiroaki, to Bunker Ramo Corporation. Locking mechanism for coupling and uncoupling electrical connectors. 4,232,926, Cl. 339-45.00M.
Inouye, Hiromasa: *See*—
Otsuki, Tomonari; and Inouye, Hiromasa, 4,232,923, Cl. 339-17.0LC.
Inseco Associates, Inc.: *See*—
Eggermann, Paul P., 4,232,823, Cl. 238-7.000.
Institut Francais du Petrole: *See*—
Boret, Roger; Bronner, Charles; Huin, Roland; and Vidal, Andre, 4,233,268, Cl. 422-190.000.
International Business Machines Corporation: *See*—
Balderes, Demetrios; Lynch, John R.; and Yacavonis, Robert A., 4,233,645, Cl. 361-385.000.
Darrow, Russell E.; Memis, Irving; and Poliak, Richard M., 4,233,620, Cl. 357-74.000.
Devine, William T.; and Gianopulos, William, 4,233,667, Cl. 364-900.000.
Friedman, Jules D.; and Saraf, Lumdas H., 4,233,337, Cl. 427-84.000.
Hwang, Un-Pah; and Simons, Robert E., 4,233,644, Cl. 361-384.000.
Kane, Milburn H., 4,232,975, Cl. 400-144.200.
Wilczynski, Janusz S., 4,232,969, Cl. 356-401.000.
International Computers Limited: *See*—
Hankins, Harold C. A.; Hughes, Gordon; and Laker, Robert W., 4,233,601, Cl. 340-703.000.
International Flavors & Fragrances Inc.: *See*—
Slangan, Gary; and Tsunashima, Masaaki, 4,233,325, Cl. 426-107.000.
International Lead Zinc Research Organization, Inc.: *See*—
Kronstein, Max, 4,233,088, Cl. 148-6.160.
International Vitamin Corp.: *See*—
Jehle, Felix A.; and Aly, Fawzy, 4,233,324, Cl. 426-96.000.
Inukai, Yuzo: *See*—
Tada, Sugihiko; and Inukai, Yuzo, 4,233,397, Cl. 430-449.000.
Ishitani, Tohru: *See*—
Tamura, Hifumi; and Ishitani, Tohru, 4,233,509, Cl. 250-306.000.
Ishiyama, Toshio: *See*—
Kawabata, Toshio; and Ishiyama, Toshio, 4,233,461, Cl. 562-554.000.
Ispen Industries International Gesellschaft mit beschrankter Haftung: *See*—
Limque, Ferdinand; and Bless, Franz, 4,232,852, Cl. 266-80.000.
Ito, Daizaburo, to Kai Cutlery Center Co., Ltd. Knife apparatus. 4,232,445, Cl. 30-162.000.
Ito, Hiroaki: *See*—
Inouye, Hiromasa; Kato, Matsuo; and Ito, Hiroaki, 4,232,926, Cl. 339-45.00M.
ITT Industries, Inc.: *See*—
De Kock, Cornelis, 4,232,767, Cl. 188-319.000.
Iverson, James R.; and Alcock, Derrick N., to Electric Machinery Mfg. Company. Electrical power switching apparatus with sliding fuse drawer and interlock system. 4,233,643, Cl. 361-344.000.
Iwane, Hiroshi: *See*—
Takeda, Makoto; Iwane, Hiroshi; and Hashimoto, Takashi, 4,233,226, Cl. 260-345.200.
Iwashita, Tomonori: *See*—
Fukahori, Hidehiko; Iwashita, Tomonori; and Mashimo, Yukio, 4,232,958, Cl. 354-212.000.
Iwatate, Fujio: *See*—
Hirayama, Kazuhiro; Sato, Yasushi; Tokiwa, Taisuke; Kawakubo, Kazuo; Iwatate, Fujio; and Nakatsui, Hisashi, 4,233,612, Cl. 346-160.000.
Izard, David G.: *See*—
Baehr, Donald O.; and Izard, David G., 4,233,368, Cl. 428-538.000.
J. B. Foote Foundry Co., The: *See*—
Hauser, Hans; and Clayborne, William J., 4,232,569, Cl. 74-701.000.
J. J. Barker Company Limited: *See*—
Barker, John C.; and McLaughlin, Ivan P., 4,233,343, Cl. 427-264.000.
J. V. Manufacturing & Welding, Inc.: *See*—
Ulrich, James A., 4,232,599, Cl. 100-25.000.
Jackering, Gunther: *See*—
Wieg, Andras J.; and Jackering, Gunther, 4,233,406, Cl. 435-275.000.
Jacobs, Melvin J., to Triram Corporation. Material for waterproofing bridge decks and the like. 4,233,356, Cl. 428-244.000.
Jacobs, Ralph R.: *See*—
Emmett, John L.; Jacobs, Ralph R.; Krupke, William F.; and Weber, Marvin J., 4,233,570, Cl. 331-94.50F.
Jacobs, Ronald S. Mobile ladder-scaffolding system. 4,232,759, Cl. 182-39.000.
Jacobson, Allan J.: *See*—
Whittingham, M. Stanley; and Jacobson, Allan J., 4,233,375, Cl. 429-194.000.
Jacquelin, Roland, to Commissariat a l'Energie Atomique. Safety apparatus for a nuclear reactor. 4,233,115, Cl. 176-36.00C.
Jacquet, Bernard; Papantoniou, Christos; Dufaure, Pierre; and Mahieu, Claude, to L'Oreal. Anti-solar acrylamide derivative polymers, method of making the same and cosmetic compositions containing the same. 4,233,430, Cl. 526-259.000.
Jagenberg-Werke Aktiengesellschaft: *See*—
Buschmann, Gerhard, 4,232,802, Cl. 222-56.000.
Janovsky, Franz, to Viennatone Gesellschaft m.b.H. Prosthesis joint. 4,232,405, Cl. 3-12.300.
Jansen, Renate Galinke nee, heir: *See*—
Eschwey, Helmut; Galinke, Joachim, deceased; and Wiemers, Norbert, 4,233,194, Cl. 260-22.00A.
Jansma, Roger H.: *See*—
Ballweber, Edward G.; Jansma, Roger H.; and Phillips, Kenneth G., 4,233,411, Cl. 525-155.000.
Japan Automobile Research Institute, Inc.: *See*—
Yoshio, Komaki; Shigehisa, Fukuda; Tsuguhiro, Fukuda; Noriaki, Nakao; Katsuhide, Suzuki; and Matsuo, Ishizuka, 4,232,895, Cl. 296-65.00A.
Jarder, Lars; and Ahlstroem, Bengt. Pressure sensitive device. 4,233,523, Cl. 307-119.000.
Jargiello, Paul, to Polychrome Corporation. Lithographic printing plate having dual photosensitive layering. 4,233,390, Cl. 430-156.000.
Jefco Laboratories, Incorporated: *See*—
Cox, Norman D., 4,232,595, Cl. 98-59.000.
Jehle, Felix A.; and Aly, Fawzy, to International Vitamin Corp. Isolated soy protein composition. 4,233,324, Cl. 426-96.000.
Jeng, Wang-Shing. Rotary pump. 4,233,003, Cl. 418-8.000.
Jenkins, Sherman. Reconfigurable loop of tubular elements. 4,232,473, Cl. 46-1.00R.
Jensen, Axel; and Molgaard, Niels, to Grundfos A/S. Control circuit for an A.C. motor. 4,233,551, Cl. 318-809.000.
Johann, Donald F.: *See*—
Walberg, Per-Erik; Johann, Donald F.; and Mendenhall, Charles E., 4,233,666, Cl. 364-900.000.
Johansson, Lars. Belt buckle. 4,232,428, Cl. 24-188.000.
John Formby & Company Limited: *See*—
Formby, John A., 4,233,499, Cl. 235-92.0MP.
John Gladstone & Company (Engineering) Limited: *See*—
Finlay-Maxwell, David, 4,233,120, Cl. 203-2.000.
Johns-Manville Corporation: *See*—
Cunningham, Richard N.; Smith, Douglas D.; and Loeffler, Romain E., deceased, 4,233,100, Cl. 156-260.000.
Gross, Stephen E.; Cain, Clifford W., Jr.; Bilawsky, Paul D.; and Scheffel, Norman B., 4,233,379, Cl. 429-247.000.
Johnson, Albert V. Heat arrester boot for room stove. 4,232,732, Cl. 165-77.000.
Johnson, Christian E., Sr., to United States of America, Commerce. Ultra-black coating due to surface morphology. 4,233,107, Cl. 156-632.000.

Johnson, Dwight N., to Textron Inc. Fluid control valve and liner therefor. 4,232,851, Cl. 251-61.100.
Johnson, Fred J.; and Bell, Richard L., to Container Corporation of America. Clamshell type carton. 4,232,816, Cl. 229-33.000.
Johnson, Glenn W., Jr.; and Heenan, Sidney A., to Amerace Corporation. Pavement marker. 4,232,979, Cl. 404-16.000.
Johnson, Howard L. Trailer with multiple bale elevating apparatus and method of bale handling. 4,232,986, Cl. 414-24.500.
Johnson & Johnson: *See*—
Lindemann, Martin K. O.; and Verdicchio, Robert J., 4,233,192, Cl. 252-545.000.
Johnson & Johnson Baby Products Company: *See*—
Elias, Robert T.; and Holtman, Dennis C., 4,233,345, Cl. 427-325.000.
Johnson, Matthey & Co., Limited: *See*—
Knapton, Arthur G.; and McGill, Ian R., 4,233,185, Cl. 252-462.000.
Johnson, Peter D.; and Jones, Charles E., to General Electric Company. Photoflash lamp having expandable burning volume. 4,233,023, Cl. 431-362.000.
Johnson, Timothy F.: *See*—
Mammino, Joseph; Johnson, Timothy F.; Walters, David W.; and Perez, Steven R., 4,233,387, Cl. 430-137.000.
Johnson, Warren E., to Sherwood Tool, Incorporated. Cup making machine having applicator mechanism. 4,232,590, Cl. 493-10.000.
Jon, Min-Chung; and Palazzo, Vito, to Western Electric Company, Inc. Methods for determining bond failure modes using stress wave emission techniques. 4,232,558, Cl. 73-801.000.
Jones, Charles E.: *See*—
Johnson, Peter D.; and Jones, Charles E., 4,233,023, Cl. 431-362.000.
Jones, Clarence E.: *See*—
Harmon, George L.; Monroe, Ronald D.; Munday, Thomas M.; Jones, Clarence E.; and Baker, Edward B., 4,232,456, Cl. 35-25.000.
Jones, Myron, Jr.: *See*—
Mangam, William M., Jr.; Willis, John J., Jr.; and Jones, Myron, Jr., 4,232,531, Cl. 62-171.000.
Jones, Norman; and Dawson, Peter, to Clemead Limited. Method for the production of waterproof and like fabrics. 4,233,358, Cl. 428-246.000.
Jongerius, Hermanus M.; and van der Wolf, Rein W., to U.S. Philips Corporation. Low-pressure mercury vapor discharge lamp. 4,233,653, Cl. 362-84.000.
Joo', Louis A.; and Miller, Frederick C., to Great Lakes Carbon Corporation. Process for manufacture of positive electrode for lithium/-metal sulfide secondary cell. 4,233,378, Cl. 429-220.000.
Joppien, Hartmut: *See*—
Kruger, Hans-Rudolf; Arndt, Friedrich; Baumert, Dietrich; Joppien, Hartmut; Pieroh, Ernst A.; and Rusch, Reinhart, 4,233,059, Cl. 71-92.000.
Joseph Gamell Industries, Inc.: *See*—
Gamell, Joseph A., 4,232,991, Cl. 415-90.000.
Juntgen, Harald; Knoblauch, Karl; Degel, Josef; Zundorf, Dieter; and Giessler, Klaus, to Bergwerksverband GmbH. Manufacture of abrasion-resistant coke. 4,233,117, Cl. 201-6.000.
Jurges, Peter: *See*—
Hitschfel, Gerhard; Jurges, Peter; and Munk, Rudolf, 4,233,026, Cl. 8-52.000.
K-B Engineering Co.: *See*—
Kice, Jack W., 4,232,632, Cl. 119-82.000.
K & S Baubeschlage Hugo Kruger KG, Firma: *See*—
Kern, Klaus, 4,232,626, Cl. 114-285.000.
Kabel- und Metallwerke Gutehoffnungshuette AG: *See*—
Rohner, Peter; and Still, Michael, 4,232,935, Cl. 350-96.230.
Kabushiki Kaisha Suwa Seikosha: *See*—
Murata, Masami, 4,233,681, Cl. 368-242.000.
Kai Cutlery Center Co., Ltd.: *See*—
Ito, Daizaburo, 4,232,445, Cl. 30-162.000.
Kaiser Aluminum & Chemical Corporation: *See*—
Brown, William E., 4,233,078, Cl. 106-56.000.
Kalka, Josef; Hentschel, Bernhard; and Ziebarth, Jurgen, to Chemische Werke Huels Aktiengesellschaft. Continuous process for the removal of monomeric impurities from aqueous dispersions of homo- and copolymers of vinyl chloride. 4,233,437, Cl. 528-500.000.
Kalns, Rudolph W., to Chloride, Incorporated. Apparatus for detecting the passage of glowing embers. 4,233,504, Cl. 250-214.0RC.
Kalopissis, Gregoire; Bugaut, Andree; and Estradier, Francoise, to L'Oreal. Diphenylamines N-monosubstituted in the 4'-position and the use thereof in dye compositions for keratinic fibers. 4,233,241, Cl. 564-221.000.
Kamino, Yasumi: *See*—
Inaba, Hideya; Nagai, Kenichi; Kamino, Yasumi; and Maeda, Kazuo, 4,233,183, Cl. 252-432.000.
Kammlade, William G., Jr. Method and apparatus for indicating the onset of parturition. 4,232,686, Cl. 128-775.000.
Kane, Milburn H., to International Business Machines Corporation. Print hammer control. 4,232,975, Cl. 400-144.200.
Kanebo, Ltd.: *See*—
Ohtomo, Koichiro; and Horikawa, Yukio, 4,233,211, Cl. 260-123.700.
Otoi, Kiyoshi; and Horikawa, Yukio, 4,233,212, Cl. 260-123.700.
Kanebo Spun Silk, Ltd.: *See*—
Ohtomo, Koichiro; and Horikawa, Yukio, 4,233,211, Cl. 260-123.700.
Otoi, Kiyoshi; and Horikawa, Yukio, 4,233,212, Cl. 260-123.700.
Kaneko, Kenji; and Okabe, Takahiro, to Hitachi, Ltd. Oscillation circuit. 4,233,574, Cl. 331-108.00D.
Kaneko, Yutaka: *See*—
Fujiwhara, Mitsuto; Matsuo, Syunji; Masukawa, Toyoaki; Kaneko, Yutaka; and Kawasaki, Mikio, 4,233,400, Cl. 430-523.000.
Kanno, Takashi: *See*—
Katsura, Hiromitsu; Endo, Morihiko; and Kanno, Takashi, 4,233,206, Cl. 260-42.210.
Kaplow, Roy; and Lewis, Marvin C., to General Solar Energy Corporation. Passive solar device for heating and cooling. 4,232,731, Cl. 165-48.00S.
Kaplow, Roy; Butz, David E.; and Stenfors, Alan L., to Data Packaging Corporation. Disk pack bottom- cover with magnetic latch. 4,233,586, Cl. 335-303.000.
Karg, Rudolph F., to Copolymer Rubber & Chemical Corp. Free flowing particles of elastomeric material and method. 4,233,365, Cl. 428-404.000.
Karl, Rupert: *See*—
Husges, Gerd; and Karl, Rupert, 4,232,508, Cl. 57-22.000.
Karlsson, Stig A., to Uddeholms Aktiebolag. Apparatus for powder manufacture by atomizing a molten material. 4,233,007, Cl. 425-7.000.
Karp, Joel A.; Lee, Ilbok; and Reed, John A., to National Semiconductor Corporation. X Sense AMP memory. 4,233,675, Cl. 365-205.000.
Karpe, Wolfgang; Kluge, Johannes; and Oemus, Klaus-Dieter, to Mannesmann Demag AG. Switch. 4,233,479, Cl. 200-77.000.
Karpinsky, William J., to Container Corporation of America. Carton erecting apparatus. 4,232,591, Cl. 493-314.000.
Kashihara, Manabu; Okamura, Kikuo; Muguruma, Yoshikata; Yamano, Shizuo; and Mizusawa, Shigeo, to Shinpo Kogyo Kabushiki Kaisha. Stepless speed change gear. 4,232,561, Cl. 74-191.000.
Kasper, Daniel K., to Warner & Swasey Company, The. Force measuring device for a chuck or collet. 4,232,547, Cl. 73-141.00A.
Kassat, Harry: *See*—
Ingram, Jocely P.; Kassat, Harry; and Kolenda, Herbert, 4,232,729, Cl. 165-39.000.
Kathawala, Faizulla G., to Sandoz, Inc. Cyclopropyl sulfonium salts. 4,233,292, Cl. 424-185.000.
Kato, Matsuo: *See*—
Inouye, Hiromasa; Kato, Matsuo; and Ito, Hiroaki, 4,232,926, Cl. 339-45.00M.
Kato, Yoshiaki: *See*—
Yoshikawa, Kenichi; Koshikawa, Makoto; Umemoto, Toshio; Satoh, Tetsuo; Ichikawa, Singo; and Kato, Yoshiaki, 4,232,512, Cl. 368-82.000.
Katsube, Junki: *See*—
Ono, Keiichi; Sasajima, Kikuo; Katsube, Junki; and Yamamoto, Hisao, 4,233,307, Cl. 424-267.000.
Shimomura, Hiromi; Sugie, Akihiko; and Katsube, Junki, 4,233,222, Cl. 260-343.30P.
Katsuhide, Suzuki: *See*—
Yoshio, Komaki; Shigehisa, Fukuda; Tsuguhiro, Fukuda; Noriaki, Nakao; Katsuhide, Suzuki; and Matsuo, Ishizuka, 4,232,895, Cl. 296-65.00A.
Katsura, Hidetoshi: *See*—
Tsuchihashi, Michihiro; Saito, Masato; Yamanoshita, Makota; Katsura, Hidetoshi; Myodo, Osamu; and Maeyama, Koichiro, 4,233,654, Cl. 362-231.000.
Katsura, Hiromitsu; Endo, Morihiko; and Kanno, Takashi, to Toyo Ink Manufacturing Co., Ltd. Process for the production of colored polyolefin molded articles and colorants used therein. 4,233,206, Cl. 260-42.210.
Kattermann, Dietrich E.: *See*—
Rothmayer, Noel Y.; Keusch, Preston; and Kattermann, Dietrich E., 4,233,146, Cl. 204-255.000.
Kaufmann, Frank H.; and Kramer, Charles F., to Steel Heddle Manufacturing Company. Heddle frame nose guide. 4,232,713, Cl. 139-91.000.
Kautex-Maschinenbau, GmbH: *See*—
Hagen, Reinold, 4,233,009, Cl. 425-142.000.
Kawabata, Toshio; and Ishiyama, Toshio, to Sumitomo Chemical Company, Limited. Process for preparing colorless methionine. 4,233,461, Cl. 562-554.000.
Kawabe, Yunosuke, to Fujitsu Limited. Method of manufacturing semiconductor devices having improved alignment marks. 4,233,091, Cl. 148-175.000.
Kawakubo, Kazuo: *See*—
Hirayama, Kazuhiro; Sato, Yasushi; Tokiwa, Taisuke; Kawakubo, Kazuo; Iwatate, Fujio; and Nakatsui, Hisashi, 4,233,612, Cl. 346-160.000.
Kawamoto, Shunichi: *See*—
Ando, Momofuku; Minami, Junichi; Takata, Mitsumune; Ohnishi, Fumio; and Kawamoto, Shunichi, 4,233,327, Cl. 426-242.000.
Kawano, Mitugi: *See*—
Sato, Kunihiko; Urata, Tetsuro; Asamoto, Tetsuhiro; Asakawa, Kobun; Uebayashi, Takeo; and Kawano, Mitugi, 4,233,485, Cl. 219-69.00M.
Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Uozumi, Yukio, 4,232,611, Cl. 105-215.00R.
Kawasaki, Mikio: *See*—
Fujiwhara, Mitsuto; Matsuo, Syunji; Masukawa, Toyoaki; Kaneko, Yutaka; and Kawasaki, Mikio, 4,233,400, Cl. 430-523.000.
Kawasaki Steel Corporation: *See*—
Bando, Seiji; and Sadao, Ebata, 4,232,853, Cl. 266-114.000.
Kawasumi, Yoshio: *See*—
Sato, Haruki; and Kawasumi, Yoshio, 4,233,254, Cl. 264-37.000.

Kawata, Shoji: *See*—
Ochiai, Takeshi; Muto, Masahito; Sakakibara, Naoji; and Kawata, Shoji, 4,232,757, Cl. 180-176.000.

Kaye, Larry A.; and Koros, Robert M., to Exxon Research & Engineering Co. Gas liquid distributor. 4,233,269, Cl. 422-207.000.

Kazihata, Ryohei: *See*—
Tamura, Masamitu; Yasuhara, Yukio; Nakamura, Shigeharu; Sakai, Masaru; Akagi, Kazuo; Kazihata, Ryohei; and Satohara, Norio, 4,233,108, Cl. 156-639.000.

KBG Corporation: *See*—
Benedetto, Kenneth R.; and Linder, Larry J., 4,232,553, Cl. 73-516.0LM.

KDM Elecktronik GmbH: *See*—
Aigner, Georg, 4,232,550, Cl. 73-258.000.

Keating, Kenneth P.: *See*—
Nieh, Edward C. Y.; and Keating, Kenneth P., 4,233,447, Cl. 544-352.000.

Keene Corporation: *See*—
Fabbri, William C., 4,233,651, Cl. 362-33.000.

Keeton, John H. Metal-working hand tool. 4,232,621, Cl. 113-54.00R.

Kegel, Robert: *See*—
Hoerauf, Werner; Valentin, Guenter; Kegel, Robert; and Kuhn, Helmut, 4,233,429, Cl. 526-71.000.

Kelly, Charles J.: *See*—
Gray, Charles R.; Hazen, John O.; and Kelly, Charles J., 4,232,493, Cl. 52-221.000.

Kelly, Robert C., to Upjohn Company, The. 2-Decarboxy-2-hydroxymethyl-9-deoxy-6,9α-epoxymethano-5,6-didehydro-PGF$_1$ compounds. 4,233,225, Cl. 260-345.200.

Kelsey Hayes Co.: *See*—
Augustine, Robert F., 4,233,587, Cl. 338-96.000.

Kemner, Rudolf; and Cramer, Rudy R., to U.S. Philips Corporation. Television pick-up device suitable for a discontinuous recording of information during continuous operation. 4,233,633, Cl. 358-221.000.

Kempf, Alfons, to Frentrup, Adolf; and Kempf, Alfons. Armor plated safe. 4,232,613, Cl. 109-40.000.

Kempf, Paul S. Optical comparator with 3-D image. 4,232,968, Cl. 356-393.000.

Kennecott Copper Corporation: *See*—
Bower, Terry F.; Randlett, M. Ronald; and Shinopulos, George, 4,232,727, Cl. 164-76.000.

Kerbel, Sheldon J., to Hazeltine Corporation. Apparatus for changing the scale of a logarithmic signal. 4,233,564, Cl. 328-145.000.

Kerkhofs, Jacques G., to AGFA-GEVAERT N.V. Method and apparatus for applying a plurality of superposed layers to a web by curtain coating. 4,233,346, Cl. 427-345.000.

Kern, Klaus, to K & S Baubeschlage Hugo Kruger KG, Firma. Device for controlling the orientation of a boat in water. 4,232,626, Cl. 114-285.000.

Kern, Rene; and Augustin, Daniel, to ATO Chimie. Separation of sulphonic acids from the medium in which they are prepared. 4,233,236, Cl. 260-504.00S.

Kero Metal Products Co., Inc.: *See*—
Bukaitz, Finley M., 4,232,920, Cl. 312-257.00R.

Kerwin, William J.: *See*—
Hosterman, Craig; and Kerwin, William J., 4,232,698, Cl. 137-68.00R.

Ketterer, Stanley J., to Singer Company, The. Bobbin winder arrangement for sewing machine looptaker. 4,232,618, Cl. 112-184.000.

Keusch, Preston: *See*—
Rothmayer, Noel Y.; Keusch, Preston; and Kattermann, Dietrich E., 4,233,146, Cl. 204-255.000.

Khan, A. Hameed: *See*—
Driscoll, John S.; Khan, A. Hameed; and Chou, Feng-Te, 4,233,215, Cl. 260-239.0EQ.

Khoylian, Rouzas R.; Cowdery, James R.; and Park, David B., to Design & Process Engineering, Inc. Infeed assembly and a discharge assembly for a conveyor system. 4,232,779, Cl. 198-472.000.

Kice, Jack W., to K-B Engineering Co. Live fowl conveying system. 4,232,632, Cl. 119-82.000.

Kijewski, Joachim, to Auto-Weber GmbH & Co. KG. Device for gripping tired wheels of a vehicle. 4,232,893, Cl. 294-82.0AH.

Kikkawa, Ikuo: *See*—
Uyeo, Shoichiro; Yoshioka, Mitsuru; Tsuji, Teruji; Kikkawa, Ikuo; and Nagata, Wataru, 4,233,216, Cl. 260-239.00A.

Kikuchi, Tomoo. Screen with high luminance and wide angle. 4,232,939, Cl. 350-129.000.

Kilbourn, Edward E.; Weiler, Ernest D.; and Weir, William D., to Rohm and Haas Company. 3-Pyridylmethylthiocarbamates. 4,233,289, Cl. 424-84.000.

Killorin, Francis H. System for use with solar collector. 4,232,657, Cl. 126-427.000.

Kilpper, Gerhard; and Grimmer, Johannes, to BASF Aktiengesellschaft. Continuous manufacture of anthranilic acid. 4,233,459, Cl. 562-458.000.

Kim, Chang J.: *See*—
Murrell, Lawrence L.; Kim, Chang J.; and Grenoble, Dane C., 4,233,139, Cl. 208-112.000.

Kim, Sung C.; and Schwartz, Marvin P. Double-walled finned heat transfer tube. 4,232,735, Cl. 165-183.000.

Kimber, Erich V., to Atlas Copco Aktiebolag. Drill boom arrangement. 4,232,848, Cl. 248-652.000.

Kimber, Erich V.; and Lundstrom, Axel L., to Atlas Copco Aktiebolag. Drill boom arrangement. 4,232,849, Cl. 248-654.000.

Kimber, Erich V.; and Hokby, Nils, to Atlas Copco Aktiebolag. Drill boom arrangement. 4,232,850, Cl. 248-654.000.

Kimberlin, Dan R., to General Motors Corporation. Floor mounted shift control mechanism with drive transmitting cables. 4,232,571, Cl. 74-878.000.

Kimoto, Koichi: *See*—
Okai, Sakuo; and Kimoto, Koichi, 4,233,391, Cl. 430-281.000.

Kimura, Shoichi; Takahashi, Toshihiko; and Tamura, Zensuke, to Hitachi, Ltd. Process and apparatus for purifying raw coal gas. 4,233,275, Cl. 423-230.000.

Kine, Benjamin B.: *See*—
Novak, Ronald W.; and Kine, Benjamin B., 4,233,362, Cl. 428-332.000.

King, Arthur S. Method and apparatus for extracting polar substances from solution. 4,233,134, Cl. 204-186.000.

Kingsdown Medical Consultants Limited: *See*—
Steer, Peter L.; and Edwards, John V., 4,232,672, Cl. 128-283.000.

Kingsley, Jack D., to General Electric Company. Solid state radiation detector and arrays thereof. 4,233,514, Cl. 250-370.000.

Kinney, George A., to Du Pont de Nemours, E. I., and Company. Apparatus for preparing a nonwoven web. 4,233,014, Cl. 425-174.80R.

Kirchhofer, Hubert: *See*—
Croes, Nicolaus; Horler, Hansulrich; and Kirchhofer, Hubert, 4,232,999, Cl. 417-64.000.

Kirkpatrick, Jesse C.: *See*—
Hauk, Ernest D.; and Kirkpatrick, Jesse C., 4,232,752, Cl. 175-135.000.

Kirtley, James L., Jr., to Massachusetts Institute of Technology. Variable speed electronic motor. 4,233,548, Cl. 318-138.000.

Kita, Nobuyuki: *See*—
Shiba, Keisuke; and Kita, Nobuyuki, 4,233,393, Cl. 430-265.000.

Kitai, Kiyoshi; and Ogihara, Masuo, to Seiko Koki Kabushiki Kaisha. Time detecting device for a clock. 4,232,511, Cl. 368-73.000.

Kitamura, Takashi; Watanabe, Asao; Nakano, Takashi; Masaki, Katsumi; Hirayama, Kazuhiro; Sato, Yasushi; and Tokiwa, Taisuke, to Canon Kabushiki Kaisha. Recording position adjuster. 4,232,954, Cl. 354-7.000.

Kitzing, Rainer; Scott, John G. V.; Webb, Terence C.; and Evans, Graham, to Ciba-Geigy Aktiengesellschaft. Photographic elements containing amino-substituted hydroxy-pyridones. 4,233,399, Cl. 430-510.000.

Kizler, Alfred: *See*—
Dobler, Klaus; Zrenner, Christian; Schirmer, Gunter; and Kizler, Alfred, 4,232,545, Cl. 73-35.000.

Kjellin, Per G.: *See*—
Bergstrand, Sten H. A. M.; Kjellin, Per G.; Persson, Carl G. A.; and Sorenby, Lars M., 4,233,303, Cl. 424-253.000.

Klaassen, Francois M.; and Appels, Johannes A., to U.S. Philips Corporation. Field effect transistor with insulated gate electrode. 4,233,617, Cl. 357-23.000.

Klaue, Hermann. Full-coat disk brake. 4,232,763, Cl. 188-18.00A.

Klees, Garry W. Ski pole grip with self hinge for improved forward reach. 4,232,875, Cl. 280-822.000.

Klein, Albert: *See*—
Hoberg, Heinz; and Klein, Albert, 4,233,559, Cl. 324-58.50A.

Klein, Keith W.; Palmieri, Joseph M.; and Eckart, Gregory C., to General Electric Company. Apparatus and system for protecting power distribution circuits against ground faults. 4,233,639, Cl. 361-44.000.

Klein, Keith W.; Palmieri, Joseph M.; and Eckart, Gregory C., to General Electric Company. Ground fault apparatus and protection system. 4,233,640, Cl. 361-44.000.

Kleinwachter, Jurgen: *See*—
Ritter, Alfred E.; and Kleinwachter, Jurgen, 4,232,820, Cl. 237-2.00B.

Kleis, Derk, to U.S. Philips Corporation. Loudspeaker combination, comprising a plurality of dynamic loudspeakers, which are arranged adjacent each other in substantially one continuous plane. 4,233,472, Cl. 179-1.0GA.

Kleitman, David: *See*—
Russell, Lewis K.; and Kleitman, David, 4,233,674, Cl. 365-200.000.

Klendauer, Wolfgang: *See*—
Hammer, Klaus-Dieter; Gerigk, Gunter; and Klendauer, Wolfgang, 4,233,341, Cl. 427-230.000.

Kline Manufacturing Co.: *See*—
Kline, William L., 4,232,587, Cl. 91-499.000.

Kline, Mark H.; Liebel, John T., Jr.; and Sheridan, Ronald D., to Nanodata Corporation. Circuit card adapter. 4,232,924, Cl. 339-17.00L.

Kline, William L., to Kline Manufacturing Co. Fluid pump. 4,232,587, Cl. 91-499.000.

Kluge, Johannes: *See*—
Karpe, Wolfgang; Kluge, Johannes; and Oemus, Klaus-Dieter, 4,233,479, Cl. 200-77.000.

Klupfel, Kurt; and Sprengel, Heide, to Hoechst Aktiengesellschaft. Photopolymerizable transfer material. 4,233,395, Cl. 430-271.000.

Knapton, Arthur G.; and McGill, Ian R., to Johnson, Matthey & Co., Limited. Catalysts for oxidation and reduction. 4,233,185, Cl. 252-462.000.

Knauer, Karl; and Pfleiderer, Hans-Jorg, to Siemens Aktiengesellschaft. Transversal filter. 4,233,578, Cl. 333-165.000.

Knoblauch, Karl: *See*—
Juntgen, Harald; Knoblauch, Karl; Degel, Josef; Zundorf, Dieter; and Giessler, Klaus, 4,233,117, Cl. 201-6.000.

Knox Manufacturing Co.: *See*—
Brown, Donald J., 4,232,487, Cl. 51-425.000.

Knudsen, Ole F., to Danfoss A/S. Measured value receiver for the polarographic measurement of gases in liquids. 4,233,143, Cl. 204-195.00P.

Kobayashi, Akira: *See*—
Yamaguchi, Nakahiko; Hibi, Susumu; Yoshizawa, Shigeru; Yoshimoto, Shoji; and Kobayashi, Akira, 4,233,668, Cl. 365-1.000.

Kobayashi, Hideo: *See*—
Genjida, Fumihide; Nasuno, Toyoaki; Kobayashi, Hideo; and Ii, Motohiko, 4,233,170, Cl. 252-73.000.

Kobayashi, Makoto: *See*—
Saito, Shunjiro; Aue, Kazuhide; Kobayashi, Makoto; and Nakamura, Akio, 4,233,340, Cl. 427-125.000.

Kobayashi, Yosiharu: *See*—
Sugawara, Kazuo; Sanada, Sei; and Kobayashi, Yosiharu, 4,233,663, Cl. 364-515.000.

Kobe, Inc.: *See*—
Presley, Charles L., 4,233,154, Cl. 210-800.000.

Kobe Steel, Limited: *See*—
Tamura, Masamitu; Yasuhara, Yukio; Nakamura, Shigeharu; Sakai, Masaru; Akagi, Kazuo; Kazihata, Ryohei; and Satohara, Norio, 4,233,108, Cl. 156-639.000.

Koch, Christian; and Behrmann, Alfred E., to Kraftwerk Union Aktiengesellschaft. Process for preventing adhesion or caking of coal. 4,233,036, Cl. 48-210.000.

Koch, Julius: *See*—
Seebeck, Dieter; Schildmann, Jens A.; Weisrock, Reinhard; and Koch, Julius, 4,233,407, Cl. 435-311.000.

Koch, Lehel, to Vepex Fovallalkozasi Iroda Rt. Process for preparing non-specific protein concentrate and of other fodder additives having a biological activity. 4,233,210, Cl. 260-112.00R.

Koch, Rudolf; and Pfleiderer, Hans-Joerg, to Siemens Aktiengesellschaft. Charge injection device opto-electronic sensor. 4,233,527, Cl. 307-311.000.

Kochanneck, Uwe. Article storage and retrieval system. 4,232,988, Cl. 414-331.000.

Kockums Industries, Inc.: *See*—
Shields, Dean W., 4,232,792, Cl. 212-160.000.

Koeppel, Robert, to Produits Chimiques Ugine Kuhlmann. Anhydrite cellular concrete and composite building elements. 4,233,080, Cl. 106-87.000.

Koike, Tadao, to Ricoh Company, Ltd. Device for positioning movable reflector of optical system of electrophotographic copying apparatus. 4,232,963, Cl. 355-49.000.

Koiwai, Tamotsu: *See*—
Hashimoto, Akihiko; and Koiwai, Tamotsu, 4,232,956, Cl. 354-106.000.

Kolbel, Hans J.; and Andres, Harald, to Volkswagenwerk Aktiengesellschaft. Suspension arrangement for motor vehicles. 4,232,881, Cl. 280-721.000.

Kolenda, Herbert: *See*—
Ingram, Jocely P.; Kassat, Harry; and Kolenda, Herbert, 4,232,729, Cl. 165-39.000.

Kolk, Glenn R.; and Haraka, Wayne. Crabbing chum lure. 4,232,471, Cl. 43-44.990.

Koller, Josef; Horn, Ulrich; Moser, Peter; Motter, Manfred; and Galafassi, Pierre, to Ciba-Geigy Corporation. Process for the level dyeing of polyacrylonitrile materials of slow, normal and rapid absorptive capacity. 4,233,028, Cl. 8-534.000.

Komeda, Tadao: *See*—
Takemoto, Toyoki; Komeda, Tadao; Yamada, Haruyasu; and Inoue, Michihiro, 4,233,615, Cl. 357-22.000.

Konetehdas Maskinfabrik NORCAR Ky Kb: *See*—
Carlsson, Kaj, 4,232,753, Cl. 180-9.20R.

Konijnendijk, Willem L.: *See*—
van de Spijker, Willebrordus H. M. M.; and Konijnendijk, Willem L., 4,233,538, Cl. 313-486.000.

Konishiroku Photo Industry Co., Ltd.: *See*—
Fujiwhara, Mitsuto; Matsuo, Syunji; Masukawa, Toyoaki; Kaneko, Yutaka; and Kawasaki, Mikio, 4,233,400, Cl. 430-523.000.

Konnai, Makoto: *See*—
Takematsu, Tetsuo; Konnai, Makoto; and Omokawa, Hiroyoshi, 4,233,061, Cl. 71-103.000.

Konnerth, Andrew, III: *See*—
Terrell, George C.; and Konnerth, Andrew, III, 4,232,634, Cl. 122-41.000.

Konya, Calvin J. Explosive composition forming no water as a reaction product during detonation. 4,233,094, Cl. 149-43.000.

Korchnak, Joseph D., to Davy Powergas Inc. Process for purifying crude phosphoric acid. 4,233,278, Cl. 423-321.00S.

Koros, Robert M.: *See*—
Kaye, Larry A.; and Koros, Robert M., 4,233,269, Cl. 422-207.000.

Kosaka, Hidetoshi: *See*—
Machashi, Yukio; and Kosaka, Hidetoshi, 4,233,665, Cl. 364-715.000.

Koseki, Wasuke; Mori, Kunihito; Obata, Hideo; and Shinchi, Yoshikazu, to Matsushita Electric Industrial Co., Ltd. Agitator-type washing machine. 4,232,536, Cl. 68-12.00R.

Koshikawa, Makoto: *See*—
Yoshikawa, Kenichi; Koshikawa, Makoto; Umemoto, Toshio; Satoh, Tetsuo; Ichikawa, Singo; and Kato, Yoshiaki, 4,232,512, Cl. 368-82.000.

Koul, Maharaj K., to Foote Mineral Company. Effective boron alloying additive for continuous casting fine grain boron steels. 4,233,065, Cl. 75-134.00S.

Kovacs, John M. Camera multiple exposure control mechanism. 4,232,957, Cl. 354-209.000.

Kovacs nee Mindler, Vera: *See*—
Szebenyi nee Gyori, Eniko; Kovacs nee Mindler, Vera; Redey, Laszlo; and Szemos nee Szonyi, Agnes, 4,233,121, Cl. 204-59.00R.

Kozlowski, Deborah R.: *See*—
Aharoni, Shaul M.; Sibilia, John P.; and Kozlowski, Deborah R., 4,232,951, Cl. 350-350.00R.

Kozuka, Nobuhiko: *See*—
Aizawa, Tatsuo; Kozuka, Nobuhiko; and Hasegawa, Yuji, 4,233,386, Cl. 430-125.000.

Kraft, Joseph K., to Westinghouse Electric Corp. Step link for transportation apparatus. 4,232,783, Cl. 198-851.000.

Kraftwerk Union Aktiengesellschaft: *See*—
Koch, Christian; and Behrmann, Alfred E., 4,233,036, Cl. 48-210.000.
Losel, Georg, 4,232,635, Cl. 122-406.0ST.

Kramer, Charles F.: *See*—
Kaufmann, Frank H.; and Kramer, Charles F., 4,232,713, Cl. 139-91.000.

Kramer, Wolfgang; Buchel, Karl H.; Plempel, Manfred; and Haller, Ingo, to Bayer Aktiengesellschaft. Antimicrobial agents and their use. 4,233,311, Cl. 424-273.00R.

Kraus, Menahem A.; Frommer, Moshe A.; Nemas, Mara; and Gutman, Rodika. Polyamide from aromatic phosphorus containing diamine. 4,233,434, Cl. 528-337.000.

Krause, Manfred: *See*—
Lemke, Otto; and Krause, Manfred, 4,232,566, Cl. 74-569.000.

Krause Plow Corporation: *See*—
Pfenninger, Billy J.; and Stansel, F. Harrison, 4,232,747, Cl. 172-311.000.

Kreiling, Ronald L.: *See*—
Hill, Robert C.; Nielson, Niel E.; Kreiling, Ronald L.; and Nice, Ralph A., 4,233,152, Cl. 210-703.000.

Kressel, Henry: *See*—
Botez, Dan; Ettenberg, Michael; and Kressel, Henry, 4,233,614, Cl. 357-17.000.
Hawrylo, Frank Z.; and Kressel, Henry, 4,233,090, Cl. 148-171.000.

Kroger Company, The: *See*—
Hammel, Richard L.; Schaefer, Robert H.; Lancia, Frederick N.; Wolfe, William A.; Dearth, Leonard F.; Benton, Stephen L.; Homan, H. Richard; and Bruce, Arthur P., 4,232,798, Cl. 221-12.000.

Kroll, Steve; and Schindler, James C., to Restaurant Technology, Inc. Low heat capacity fry basket assembly. 4,232,596, Cl. 99-410.000.

Kronstein, Max, to International Lead Zinc Research Organization, Inc. Phosphatization of steel surfaces and metal-coated surfaces. 4,233,088, Cl. 148-6.160.

Kruger, Hans-Rudolf; Arndt, Friedrich; Baumert, Dietrich; Joppien, Hartmut; Pieroh, Ernst A.; and Rusch, Reinhart, to Schering Aktiengesellschaft. 1,2,3-Triazole carboxylic acid amides and biocidal compositions containing the same. 4,233,059, Cl. 71-92.000.

Kruger, Jack L. Mechanical transfer switch. 4,233,481, Cl. 200-153.00D.

Krulwich, Lester S. Magnetic press and refresher for clothes. 4,232,460, Cl. 38-1.00R.

Krupke, William F.: *See*—
Emmett, John L.; Jacobs, Ralph R.; Krupke, William F.; and Weber, Marvin J., 4,233,570, Cl. 331-94.50F.

Kubota, Yukio, to Sony Corporation. Rotating magnetic head piezoelectric assembly and drive circuitry for video tape recorder. 4,233,637, Cl. 360-10.000.

Kuhar, George A., to Goodyear Tire & Rubber Company, The. Thermoplastic high acrylonitrile resins. 4,233,416, Cl. 525-234.000.

Kuhn, Helmut: *See*—
Hoerauf, Werner; Valentin, Guenter; Kegel, Robert; and Kuhn, Helmut, 4,233,429, Cl. 526-71.000.

Kuhr, Albert F., to United States Gypsum Company. Modular ceiling panel unit usable with air distribution systems. 4,232,594, Cl. 98-40.00D.

Kuki, Nobuyuki, to Aisin Seiki Kabushiki Kaisha. Outside door handle assembly for vehicles. 4,232,892, Cl. 292-347.000.

Kumar, Anand: *See*—
Pace, Salvatore J.; and Kumar, Anand, 4,233,144, Cl. 204-195.00B.

Kume, Kazunari: *See*—
Tamaru, Munetaka; Tsuzuki, Akira; Morokawa, Shigeru; Watanabe, Minoru; Kume, Kazunari; and Oono, Hideshi, 4,232,510, Cl. 368-28.000.

Kummer, David A. Bulk pasteurization of mushroom compost. 4,233,266, Cl. 422-184.000.

Kummer, Joseph T.: *See*—
Gandhi, Haren S.; Kummer, Joseph T.; Shelef, Mordecai; Stepien, Henryk K.; and Yao, Hsien C., 4,233,189, Cl. 252-472.000.

Kunishima, Mamoru: *See*—
Nakayama, Yuya; Kunishima, Mamoru; Matsuda, Akira; and Takeuchi, Tomio, 4,233,224, Cl. 260-343.600.

Kunz, Walter; Eckhardt, Wolfgang; and Hubele, Adolf, to Ciba-Geigy Corporation. Microbicidal compositions. 4,233,308, Cl. 424-279.000.

Kupferschmidt, Peter: *See*—
Sudler, Roland; Kupferschmidt, Peter; and Schwab, Jean-Francois, 4,233,680, Cl. 368-76.000.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Ozaki, Kiyoji; Fukuhara, Akinobu; Hosoi, Takuji; and Sagi, Yasuo, 4,233,137, Cl. 208-48.00Q.
Sawa, Yuji; and Endo, Sigeru, 4,233,019, Cl. 425-305.100.

Kurisaki, Konomu: *See*—
Sato, Haruhito; Ichikawa, Hiroshi; Hayashi, Hiroshi; and Kurisaki, Konomu, 4,233,161, Cl. 252-1.000.

Kurogi, Yukinori; and Sugibuchi, Kiyoshi, to Nippon Electric Co., Ltd. Semiconductor memory device having multi-gate transistors. 4,233,526, Cl. 307-238.000.

Kurozumi, Seizi: *See*—
Tanaka, Toshio; Otsu, Akira; Kurozumi, Seizi; and Wakabayashi, Toshio, 4,233,309, Cl. 424-270.000.

Kurz, Gerhard. Device indicating a state due to the pressure modification. 4,233,597, Cl. 340-626.000.

Kurz, Milton. Thermal insulating material. 4,232,620, Cl. 112-420.000.

Kurz, Otto: *See*—
Schneider, Franz; Braitinger, Helmut; Bergmann, Ewald; and Kurz, Otto, 4,232,575, Cl. 83-71.000.

Kuwakado, Satosi: *See*—
Tsuge, Noboru; Kuwakado, Satosi; Takei, Toshihiro; and Shimogawa, Toshiaki, 4,232,886, Cl. 280-806.000.

Kvita, Vratislav; Darms, Roland; and Greber, Gerd, to Ciba-Geigy Corporation. Imidyl-benzene-dicarboxylic and -tricarboxylic acid derivatives. 4,233,220, Cl. 260-326.260.

Kyker, Glendon D.; and Paul, Kalidas, to Velsicol Chemical Corporation. Process for preparing hexachlorocyclopentadiene. 4,233,251, Cl. 570-220.000.

Kyocera International, Inc.: *See*—
Nakano, Masahiko; and Miyauchi, Nobuaki, 4,232,815, Cl. 228-180.00A.

Kyomasu, Mikio; and Nakao, Yoshiharu, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor non-volatile memory. 4,233,616, Cl. 357-23.000.

Kyoto University, The President of: *See*—
Eguchi, Wataru; Harada, Makoto; Tanigaki, Masataka; and Tada, Yutaka, 4,232,543, Cl. 73-15.00A.

L. Schuler GmbH: *See*—
Schneider, Franz; Braitinger, Helmut; Bergmann, Ewald; and Kurz, Otto, 4,232,575, Cl. 83-71.000.

Laco Laboratories, Inc.: *See*—
Schpak, Fred; and Malkes, Ian D., 4,232,966, Cl. 356-244.000.

Lair, Clair K., to General Dynamics Corporation Pomona Division. Warhead orientation device. 4,232,605, Cl. 102-8.000.

Laker, Robert W.: *See*—
Hankins, Harold C. A.; Hughes, Gordon; and Laker, Robert W., 4,233,601, Cl. 340-703.000.

Lamarche, Paul E., to Borg-Warner Corporation. Extended travel vibration damper assembly. 4,232,534, Cl. 64-27.00C.

Laminoirs a Froid de Thionville: *See*—
Urbain, Daniel, 4,233,098, Cl. 156-242.000.

Lamson, Junior J.; Hall, Richard H.; Stroiwas, Edward; and Yats, Larry D., to Dow Chemical Company, The. Dehydration of α-methylbenzyl alcohols to form monovinylidene aromatic monomers. 4,233,467, Cl. 585-437.000.

Lancia, Frederick N.: *See*—
Hammel, Richard L.; Schaefer, Robert H.; Lancia, Frederick N.; Wolfe, William A.; Dearth, Leonard F.; Benton, Stephen L.; Homan, H. Richard; and Bruce, Arthur P., 4,232,798, Cl. 221-12.000.

Land, Jerry E.: *See*—
McMullan, James P.; Lindsay, Rudy E.; and Land, Jerry E., 4,233,492, Cl. 219-217.000.

Landkammer, Franz J., to Christoph Emmerich KG. Chain-type door latch and alarm. 4,233,595, Cl. 340-542.000.

Lange, Karl-Heinz, to Balda-Werke Photographische Gerate und Kunststoff GmbH & Co. KG. Pivot-joint construction for binocular telescope. 4,232,936, Cl. 350-75.000.

Langens, Jan; and Devroe, Guido, to BASF Aktiengesellschaft. Manufacture of anhydrous hydrogen chloride by combusting chlorine-containing organic substances. 4,233,280, Cl. 423-481.000.

Lanier Business Products, Inc.: *See*—
Bolick, Fred C., Jr.; Titus, Theodore, IV; and Mohammadioun, Said, 4,233,638, Cl. 360-92.000.

Lankro Chemicals Limited: *See*—
Sheridan, Geoffrey P., 4,233,174, Cl. 252-170.000.

Lanner, Christer, to Aktiebolaget Garphytte Bruk. Low-alloyed steel for the preparation of valve spring wire. 4,233,089, Cl. 148-36.000.

Lanoa, Benzion, to Savin Corporation. Method and apparatus for increasing the apparent resolution of developed electrophotographically reproduced images. 4,233,381, Cl. 430-33.000.

Lantech Inc.: *See*—
Stackhouse, William H., 4,232,501, Cl. 53-399.000.

Lanza, Emmanuel: *See*—
Lingier, Willy F. R.; Lanza, Emmanuel; and Bracke, William J. I., 4,233,418, Cl. 525-243.000.

Laporte Chemicals Limited: *See*—
Cubbon, Robert C. P.; Braid, John E.; Oates, Alfred E.; and Preston, Ronald, 4,233,462, Cl. 568-564.000.

Larsen, Frank R.: *See*—
Welling, Conrad G.; Davenport, Gordon H.; Reichert, Guenter; Snyder, Charles M.; Harrold, Milton C.; Donze, Salvatore H.; and Larsen, Frank R., 4,232,903, Cl. 299-8.000.

Larsen, Ronald F.: *See*—
Woods, Don F.; and Larsen, Ronald F., 4,232,446, Cl. 33-143.00L.

Larson, William A.; and Wilterink, Dale P. Hollow cotton roll. 4,233,025, Cl. 433-136.000.

Larsson, Stig-Goran: *See*—
Fischbeck, Kenneth H.; Larsson, Stig-Goran; and Sultan, S. Bertil, 4,233,610, Cl. 346-140.00R.

Laszcz, Stanislaw: *See*—
Bezubik, Slawomir J.; and Laszcz, Stanislaw, 4,232,857, Cl. 269-212.000.

Laud, Kamlakar R.: *See*—
Logothetis, Eleftherios M.; Laud, Kamlakar R.; and Park, John K., 4,232,441, Cl. 29-612.000.

Laurel Bank Machine Co., Ltd.: *See*—
Watanabe, Kenkichi; and Furuya, Katusuke, 4,232,690, Cl. 133-8.00R.

Lavanish, Jerome M., to PPG Industries, Inc. 3-[5-(1-Phenoxy-alkyl, -alkynyl, -alkenyl, or haloalkyl)-1,3,4-thiadiazol-2-yl]-4-hydroxy-1-methyl-2-imidazolidinones. 4,233,057, Cl. 71-090.000.

Law, Brian R.: *See*—
Craddock, Peter J.; Law, Brian R.; and Smith, Albert J., 4,232,579, Cl. 83-788.000.

Law, Graham H.: *See*—
Meyler-Warlow, Ian; and Law, Graham H., 4,233,373, Cl. 429-181.000.

Lazzara, Samuel P.: *See*—
Derby, Ronald C.; Zelinger, Stanley H.; Dampier, William P.; and Lazzara, Samuel P., 4,232,523, Cl. 60-641.000.

Le Moteur Moderne: *See*—
Pichard, Jacques, 4,232,637, Cl. 123-263.000.

LeaRonal, Inc.: *See*—
Brasch, William, 4,233,344, Cl. 427-304.000.

Leber, Karl. Support system for filing computer paper. 4,232,918, Cl. 312-184.000.

Lecerf, Andre, to SAFT-Societe des Accumulateurs Fixes et de Traction. Double chromate compositions for use as positive active material in batteries. 4,233,374, Cl. 429-194.000.

Ledig, Kurt W., deceased; and by Howes, David R., Executor, to American Home Products Corporation. 7-(Substituted)-7H-pyrrolo[3.2-F]-quinazoline-1,3-diamines. 4,233,445, Cl. 544-250.000.

Lee, Fred C., to Bechtel International Corporation. Beaded liquid product and method for reducing coefficient of friction. 4,232,981, Cl. 405-154.000.

Lee, Ilbok: *See*—
Karp, Joel A.; Lee, Ilbok; and Reed, John A., 4,233,675, Cl. 365-205.000.

Leekha, Rajendra K.: *See*—
Allgaier, Joseph M.; Richens, Jack W.; and Leekha, Rajendra K., 4,232,717, Cl. 141-179.000.

Le Fur, Bernard: *See*—
Gharadjedaghi, Fereydoun; and Le Fur, Bernard, 4,232,946, Cl. 350-320.000.

Lehmann, Gunter: *See*—
Dudeck, Christian; Lehmann, Gunter; Petri, Norbert; Diem, Hans; Fliege, Werner; Meissner, Bernd; Ross, Karl-Heinz; and Muehlthaler, Wolfgang, 4,233,246, Cl. 568-402.000.

Leibinsohn, Saul. Microbe-barrier drainage device. 4,232,677, Cl. 128-350.00R.

Leibowitz, Marshall; Crandall, Richard; and Faughnan, Brian, to Timex Corporation. Method for making electrochromic films having improved etch resistance. 4,233,339, Cl. 427-108.000.

Leichle, Claude, to Regie Nationale des Usines Renault. Method for detection of the angular position of a part driven in rotation and instrumentation using it. 4,233,592, Cl. 340-347.00P.

Leistner, William E.; Minagawa, Motonobu; Nakahara, Yutaka; and Haruna, Tohru, to Argus Chemical Corporation. Polyhydric phenol coester stabilizers. 4,233,414, Cl. 525-146.000.

Le Jeune, Gwenole, to Societe Civile Hydromer. Process and apparatus for treating matter comprising a solid phase and a liquid or pasty phase. 4,232,600, Cl. 100-37.000.

LeMay, Christopher A. G., to EMI Limited. Radiography. 4,233,662, Cl. 364-414.000.

Lemke, Harold C.; and Rohowetz, Stanley E., to American Can Company. Method of securing opener key to a container using oriented polypropylene film with solventless acrylic adhesive. 4,233,331, Cl. 426-407.000.

Lemke, Otto; and Krause, Manfred, to Carl Still, Firma. Switching lever mechanism. 4,232,566, Cl. 74-569.000.

Leonheart, William H., to McMinnville Tool & Die, Inc. Throttle twist-grip control device. 4,232,565, Cl. 74-489.000.

Lepere, Guy, to Thomson-CSF. Receiver with fixed-echo suppressor. 4,233,604, Cl. 343-7.0AG.

Leshner, Ervin; and Leshner, Michael D., to Fuel Injection Development Corporation. Charge forming system for maintaining operation of an internal combustion engine at its lean limit. 4,232,643, Cl. 123-440.000.

Leshner, Michael D.: *See*—
Leshner, Ervin; and Leshner, Michael D., 4,232,643, Cl. 123-440.000.

Letraset International Limited: *See*—
Dowzall, Martin E.; and Houssian, Vazgen J., 4,232,452, Cl. 33-430.000.

Leung, Ernest C.; and Revah, Isaac R., to Northern Telecom Limited. Latching lever for printed circuit boards. 4,233,646, Cl. 361-399.000.

Lever Brothers Company: *See*—
Melican, Nigel J. T., 4,232,674, Cl. 128-287.000.

Levin, Igor A. Method and apparatus for mixing substances. 4,232,972, Cl. 366-108.000.

Levinsky, Roland J.: *See*—
Soothill, John F.; and Levinsky, Roland J., 4,233,286, Cl. 424-12.000.

Lewis, Marvin C.: *See*—
Kaplow, Roy; and Lewis, Marvin C., 4,232,731, Cl. 165-48.00S.

Lewis, Robert A.; and Honnen, Lewis R., to Chevron Research Company. Lubricant compositions containing dispersant additives. 4,233,168, Cl. 252-51.50A.

Lewis, William J.; Harper, Leslie R.; Davis, Malcolm J.; and Gardiner, Richard G., to Rolls-Royce Limited. Flow deflecting devices. 4,232,516, Cl. 60-226.00A.

Lewis, William R.; and Smith, Dennis M., to Hunter Engineering Company. Molten metal feed tip. 4,232,804, Cl. 222-591.000.

Leybold-Heraeus GmbH: *See—*
Aichert, Hans; Dietrich, Walter; Hoffmann, Otto-Horst; Stark, Friedrich; and Stephan, Herbert, 4,233,342, Cl. 427-251.000.
Dietrich, Walter; and Stephan, Herbert, 4,233,515, Cl. 250-397.000.

Li, Norman N.: *See—*
Salathiel, William M.; Muecke, Thomas W.; Cooke, Claude E., Jr.; and Li, Norman N., 4,233,165, Cl. 252-8.55R.

Libbey-Owens-Ford Company: *See—*
Boehm, Hans W.; Herrington, Richard A.; and Oelke, Waldemar W., 4,232,809, Cl. 225-93.500.

Lichtenstein, Bernard; and Nemeth, Edward, to VIP Industries, Inc. Wire insertion guide. 4,232,443, Cl. 29-753.000.

Lidkopings Mekaniska Verkstads AB: *See—*
Nilsson, Bengt, 4,232,913, Cl. 308-9.000.

Liebel, John T., Jr.: *See—*
Kline, Mark H.; Liebel, John T., Jr.; and Sheridan, Ronald D., 4,232,924, Cl. 339-17.00L.

Liebergot, Harris L.; and Sedmak, Richard M., to Sperry Corporation. Fault detection and isolation system. 4,233,682, Cl. 371-68.000.

Lieberman, Arthur M. Children's mask. 4,232,476, Cl. 46-88.000.

Liggett Group Inc.: *See—*
Hall, Floyd V., 4,232,574, Cl. 82-84.000.

Lighting Systems, Inc.: *See—*
Zelina, Francis J., Jr.; and Zelina, John H., Jr., 4,233,655, Cl. 362-258.000.

Ligouzat, Pierre, to Societe Symac. Continuous mixing apparatus for flowable products. 4,232,973, Cl. 366-157.000.

Lilliston Corporation: *See—*
Thompson, Jack E., 4,232,744, Cl. 171-101.000.

Lim, Hong S.; Rogers, Howard H.; and Verzwyvelt, Scott A., to Hughes Aircraft Company. Process for reinforcing structurally fragile inorganic fabrics. 4,233,347, Cl. 427-352.000.

Limpaecher, Rudolf. Multicusp plasma containment apparatus. 4,233,537, Cl. 313-231.300.

Limque, Ferdinand; and Bless, Franz, to Ispen Industries International Gesellschaft mit beschrankter Haftung. Apparatus for control of the carburization of parts in a vacuum furnace. 4,232,852, Cl. 266-80.000.

Lin, Charles C. C., to Shelcore, Inc. Inflatable hassock-shaped toy. 4,232,477, Cl. 46-88.000.

Lin, Tung-Yen; and Yang, Yue-Chyou, to T. Y. Lin International. Precast units for constructing cooling towers and the like. 4,232,495, Cl. 52-224.000.

Lin, Tz-Hong: *See—*
Winchell, Harry S.; and Lin, Tz-Hong, 4,233,285, Cl. 424-1.000.

Lincoln Manufacturing Company, Inc.: *See—*
Scoville, John R.; and Gigandet, Richard W., 4,233,495, Cl. 219-386.000.

Lind, Eugene L., to Lind's Manufacturing Inc. Wood burning furnace. 4,232,651, Cl. 126-110.00E.

Lindahl, Bengt E., to Svensk Lasthantering, Bengt Lindahl AB. Lifting loop. 4,232,619, Cl. 112-417.000.

Linde Aktiengesellschaft: *See—*
Pawlik, Rudolf; and Fierlbeck, Walter, 4,233,494, Cl. 219-382.000.

Lindemann, Martin K. O.; and Verdicchio, Robert J., to Johnson & Johnson. Detergent compositions. 4,233,192, Cl. 252-545.000.

Linder, Larry J.: *See—*
Benedetto, Kenneth R.; and Linder, Larry J., 4,232,553, Cl. 73-516.0LM.

Lind's Manufacturing Inc.: *See—*
Lind, Eugene L., 4,232,651, Cl. 126-110.00E.

Lindsay, Rudy E.: *See—*
McMullan, James P.; Lindsay, Rudy E.; and Land, Jerry E., 4,233,492, Cl. 219-217.000.

Linenberger, Darrell. Bore sighting apparatus. 4,232,449, Cl. 33-235.000.

Lingier, Willy F. R.; Lanza, Emmanuel; and Bracke, William J. I., to Cosden Technology, Inc. Process for preparing rubber-modified styrene copolymers by suspension copolymerization. 4,233,418, Cl. 525-243.000.

Linke, William F.; and Marzluff, William F., to American Cyanamid Company. Stabilization of acrylamide solutions. 4,233,240, Cl. 564-4.000.

Lipp, Eberhard: *See—*
Lucke, Roland; and Lipp, Eberhard, 4,233,676, Cl. 366-147.000.

Litton Systems, Inc.: *See—*
Werginz, Karl, 4,232,833, Cl. 241-37.000.

Liu, Yung S., to General Electric Company. High power laser with tuning and line narrowing capability. 4,233,569, Cl. 331-94.50C.

Livingston, Frank E.: *See—*
Satterly, Kenneth P.; and Livingston, Frank E., 4,233,408, Cl. 521-172.000.

Lo, Jiuan P. Lock body with lock plates opened or closed by a cylindrical key bar. 4,232,539, Cl. 70-364.00R.

Locke, Peter: *See—*
Roderick, Guy A.; and Locke, Peter, 4,233,085, Cl. 136-244.000.

Lockheed Missiles & Space Co., Inc.: *See—*
Welling, Conrad G.; Davenport, Gordon H.; Reichert, Guenter; Snyder, Charles M.; Harrold, Milton C.; Donze, Salvatore H.; and Larsen, Frank R., 4,232,903, Cl. 299-8.000.

Lockshin, Robert. Hinged louvered window shade device. 4,232,483, Cl. 49-67.000.

Loeffler, Carolyn R., legal representative: *See—*
Cunningham, Richard N.; Smith, Douglas D.; and Loeffler, Romain E., deceased, 4,233,100, Cl. 156-260.000.

Loeffler, Romain E., deceased: *See—*
Cunningham, Richard N.; Smith, Douglas D.; and Loeffler, Romain E., deceased, 4,233,100, Cl. 156-260.000.

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Longenecker, Lineaus W. Calendars. 4,232,462, Cl. 40-119.000.

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Lown, Harold, to General Electric Company. Rotor rim-ventilated generator with turning vanes for rotor inlet coolant gas. 4,233,533, Cl. 310-59.000.

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Potter, James C.; and Sosnowski, Stanislaw J. A., 4,232,644, Cl. 123-450.000.

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Maehashi, Yukio; and Kosaka, Hidetoshi, to Nippon Electric Co., Ltd. Date data processor. 4,233,665, Cl. 364-715.000.
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Mammino, Joseph; Johnson, Timothy F.; Walters, David W.; and Perez, Steven R., to Xerox Corporation. Electrophotographic carrier powder coated by resin dry-mixing process. 4,233,387, Cl. 430-137.000.
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Mangam, William M., Jr.; Willis, John J., Jr.; and Jones, Myron, Jr., to Dial Manufacturing, Inc. Thermostatic control apparatus for evaporative cooling system. 4,232,531, Cl. 62-171.000.
Mangus, James D., to Westinghouse Electric Corp. Nuclear reactor coolant transport system. 4,233,116, Cl. 176-65.000.
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Meyler-Warlow, Ian; and Law, Graham H., to Heatherbourne Plastics Limited. Cell casing and grommet therefore. 4,233,373, Cl. 429-181.000.
Michelson, Anatol. Process and core box assembly for heatless production of hollow items of mineral granular material. 4,232,726, Cl. 164-12.000.
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Joo', Louis A.; and Miller, Frederick C., 4,233,378, Cl. 429-220.000.
Miller, J. Wayne; and Anderson, Mark J., to Union Oil Company of California. Desulfurization of coal. 4,233,034, Cl. 44-1.0SR.
Miller, John A.: *See—*
Casey, Gary L.; Blatter, Albert; Miller, John A.; and Claxton, William B., 4,232,830, Cl. 239-585.000.
Miller, Laurence L., to TRW Inc. Fluid controller. 4,232,708, Cl. 137-625.210.
Miller, Oliver G.: *See—*
Bourgeous, Clarence G.; and Miller, Oliver G., 4,232,883, Cl. 280-759.000.
Miller, Peter A. Travelling sheet, flat-bed filter apparatus and system. 4,233,157, Cl. 210-137.000.
Miller, Roy W., to Pullman Incorporated. Cam actuated railway hopper car door operating mechanism. 4,232,989, Cl. 414-387.000.
Mills, Harold E.: *See—*
Hirko, Ronald J.; and Mills, Harold E., 4,233,281, Cl. 423-484.000.

Mills, W. Ralph, to Reynolds Metals Company. Metallic printing inks and metallized papers printed therewith. 4,233,195, Cl. 260-23.00S.
Milton, Russell E. Dual ball towing hitch. 4,232,877, Cl. 280-415.00A.
Mimura, Masahisa; Nakano, Isamu; Okawa, Nobuo; and Tanaka, Atsushi, to Teijin Limited. Leathery sheet material and process for the preparation thereof. 4,233,359, Cl. 428-254.000.
Minagawa, Motonobu: *See*—
Leistner, William E.; Minagawa, Motonobu; Nakahara, Yutaka; and Haruna, Tohru, 4,233,414, Cl. 525-146.000.
Minagawa, Shoichi: *See*—
Mikoshiba, Nobuo; and Minagawa, Shoichi, 4,233,530, Cl. 307-424.000.
Minami, Junichi: *See*—
Ando, Momofuku; Minami, Junichi; Takata, Mitsumune; Ohnishi, Fumio; and Kawamoto, Shunichi, 4,233,327, Cl. 426-242.000.
Mindeli, Mamuka S.: *See*—
Barbakadze, Dzhondo F.; Mindeli, Mamuka S.; Macharashvili, Petr G.; Rusidze, Vazha V.; and Suladze, Otari N., 4,232,854, Cl. 266-266.000.
Minneapolis Electric Steel Castings Company: *See*—
Player, Duane W.; and Weil, James A., 4,232,834, Cl. 241-293.000.
Minnesota Mining and Manufacturing Company: *See*—
Benham, Judith L., 4,232,950, Cl. 350-349.000.
Huffman, William A., 4,232,949, Cl. 350-349.000.
Worm, Allan T., 4,233,421, Cl. 525-343.000.
Miro, Juan C., to Industria Espanola de Manufacturas Especiales, S.A. Racking mechanism for bobbin machine. 4,232,769, Cl. 192-4.00R.
Mita Industrial Co., Ltd.: *See*—
Aizawa, Tatsuo; Kozuka, Nobuhiko; and Hasegawa, Yuji, 4,233,386, Cl. 430-125.000.
Mitsubishi Denki Kabushiki Kaisha: *See*—
Kyomasu, Mikio; and Nakao, Yoshiharu, 4,233,616, Cl. 357-23.000.
Sato, Kunihiko; Urata, Tetsuro; Asamoto, Tetsuhiro; Asakawa, Kobun; Uebayashi, Takeo; and Kawano, Mitugi, 4,233,485, Cl. 219-69.00M.
Satoh, Tsuyoshi, 4,233,588, Cl. 340-21.000.
Tsuchihashi, Michihiro; Saito, Masato; Yamanoshita, Makota; Katsura, Hidetoshi; Myodo, Osamu; and Maeyama, Koichiro, 4,233,654, Cl. 362-231.000.
Mitsubishi Kinzoku Kabushiki Kaisha: *See*—
Toda, Kazuo; Hosoda, Tadashi; and Matsuo, Yutaka, 4,233,149, Cl. 204-297.00W.
Mitsubishi Paper Mills, Ltd.: *See*—
Fuchigami, Mitsuru, 4,233,178, Cl. 252-316.000.
Mitsubishi Petrochemical Co., Ltd.: *See*—
Takeda, Makotu; Iwane, Hiroshi; and Hashimoto, Takashi, 4,233,226, Cl. 260-345.200.
Mitsuishi, Yukio: *See*—
Hasegawa, Kinji; Mitsuishi, Yukio; and Masuda, Shigeyoshi, 4,233,354, Cl. 428-195.000.
Mitter & Co.: *See*—
Mitter, Mathias, 4,232,601, Cl. 101-120.000.
Mitter, Mathias, to Mitter & Co. Squeegee arrangement. 4,232,601, Cl. 101-120.000.
Miura, Tatsuya: *See*—
Maruyama, Shigeo; Nishikaichi, Yuji; Fujinaga, Shigeki; and Miura, Tatsuya, 4,233,491, Cl. 219-125.100.
Miura, Yasuki: *See*—
Ono, Masaaki; Okabe, Kazuo; and Miura, Yasuki, 4,233,352, Cl. 428-141.000.
Miyabara, Stanley M. Oil seal. 4,232,872, Cl. 277-47.000.
Miyamoto, Hiroshi: *See*—
Murata, Toshinori; Matsuura, Shigeo; Miyamoto, Hiroshi; and Akutsu, Eisaku, 4,233,591, Cl. 340-347.0DA.
Miyauchi, Nobuaki: *See*—
Nakano, Masahiko; and Miyauchi, Nobuaki, 4,232,815, Cl. 228-180.00A.
Mizuma, Yoshikuni: *See*—
Watanabe, Tamotu; Sakata, Tatsuei; and Mizuma, Yoshikuni, 4,233,072, Cl. 75-236.000.
Mizusawa, Shigeo: *See*—
Kashihara, Manabu; Okamura, Kikuo; Muguruma, Yoshikata; Yamano, Shizuo; and Mizusawa, Shigeo, 4,232,561, Cl. 74-191.000.
Mobil Oil Corporation: *See*—
Rollmann, Louis D.; and Walsh, Dennis E., 4,233,138, Cl. 208-106.000.
Mochizuki, Manabu: *See*—
Harada, Masahide; and Mochizuki, Manabu, 4,233,511, Cl. 250-325.000.
Mohammadioun, Said: *See*—
Bolick, Fred C., Jr.; Titus, Theodore, IV; and Mohammadioun, Said, 4,233,638, Cl. 360-92.000.
Molgaard, Niels: *See*—
Jensen, Axel; and Molgaard, Niels, 4,233,551, Cl. 318-809.000.
Molins Limited: *See*—
Green, Robert J.; and Hales, Gerald A., 4,233,598, Cl. 340-652.000.
Moller, Kurt H.: *See*—
Doonan, David F.; and Moller, Kurt H., 4,233,444, Cl. 544-192.000.
Momofuku Ando: *See*—
Ando, Momofuku; Minami, Junichi; Takata, Mitsumune; Ohnishi, Fumio; and Kawamoto, Shunichi, 4,233,327, Cl. 426-242.000.
Monaco, Jose R.; and Rausing, Hans A., to Tetra Pak Developpement SA. Method for sterilizing, homogenizing and packaging protein containing food. 4,233,320, Cl. 426-7.000.
Monahan, Daniel E. Process and apparatus for generating hydrogen and oxygen using solar energy. 4,233,127, Cl. 204-157.10R.
Mongault, Jacques H. C. Device for use as a cot on the rear seat of a vehicle. 4,232,413, Cl. 5-94.000.
Monma, Noboru; Maekawa, Iwao; Sarudate, Tutomu; Sato, Hidetaka; and Uchigasaki, Isao, to Hitachi Chemical Company, Ltd. Resin composition with low shrinkage. 4,233,413, Cl. 525-168.000.
Monroe, Ronald D.: *See*—
Harmon, George L.; Monroe, Ronald D.; Munday, Thomas M.; Jones, Clarence E.; and Baker, Edward B., 4,232,456, Cl. 35-25.000.
Monsanto Company: *See*—
Bulkley, Charles W., 4,233,409, Cl. 525-71.000.
Dyroff, David R.; and Lynch, Gary J., 4,233,422, Cl. 525-398.000.
Dyroff, David R.; Lynch, Gary J.; and Papanu, Victor D., 4,233,423, Cl. 525-398.000.
Mayer, James M.; and Payne, John H., 4,233,173, Cl. 252-102.000.
Van Eenam, Donald N., 4,233,417, Cl. 525-359.000.
Moon, William S., to Measurex Corporation. Method for controlling the thickness or weight of extruded stock. 4,233,255, Cl. 264-40.400.
Moore, George E., Jr. Apparatus for coupling a tractor and farm implement. 4,232,878, Cl. 280-461.00A.
Moorhouse, Major D.: *See*—
Pearson, Kenneth A.; and Moorhouse, Major D., 4,232,513, Cl. 60-39.09R.
Moran, Robert L.; and O'Hara, Francis J., to Raytheon Company. Broadband antenna element. 4,233,608, Cl. 343-728.000.
Moraw, Roland; and Schadlich, Gunther, to Hoechst Aktiengesellschaft. Process for shaping a thermoplastic layer. 4,233,380, Cl. 430-2.000.
Moreau, Michel: *See*—
Bourguignon, Jean; Sion, Marcel-Xavier; and Moreau, Michel, 4,233,245, Cl. 564-506.000.
Mori, Kunihito: *See*—
Koseki, Wasuke; Mori, Kunihito; Obata, Hideo; and Shinchi, Yoshikazu, 4,232,536, Cl. 68-12.00R.
Moriki, Yasumitsu; Takahashi, Izumi; Sakurai, Masahiro; and Shimizo, Hidehiro, to Maruma Jyusharyo Kabushikigaisha. Metal build-up apparatus with improved cooling means. 4,233,487, Cl. 219-76.110.
Morimoto, Kazuhisa: *See*—
Wakabayashi, Takashi; and Morimoto, Kazuhisa, 4,232,869, Cl. 274-37.000.
Morimoto, Kiyoshi, to Futaba Denshi Kogyo K.K. Compound semiconductor wafer. 4,233,613, Cl. 357-16.000.
Morita, Toyoo: *See*—
Takahashi, Kihei; and Morita, Toyoo, 4,232,438, Cl. 29-408.000.
Morokawa, Shigeru: *See*—
Tamaru, Munetaka; Tsuzuki, Akira; Morokawa, Shigeru; Watanabe, Minoru; Kume, Kazunari; and Oono, Hideshi, 4,232,510, Cl. 368-28.000.
Morris, Robert L.: *See*—
Scotese, Anthony C.; Morris, Robert L.; and Santilli, Arthur A., 4,233,446, Cl. 544-279.000.
Morrison-Knudsen Company, Inc.: *See*—
Oswald, George J., 4,233,652, Cl. 362-63.000.
Morton Machine Works, Incorporated: *See*—
Burgin, Charles W., 4,232,416, Cl. 8-156.000.
Moser, Peter: *See*—
Koller, Josef; Horn, Ulrich; Moser, Peter; Motter, Manfred; and Galafassi, Pierre, 4,233,028, Cl. 8-534.000.
Mosher, Mitchell R. Orthotic insert. 4,232,457, Cl. 36-44.000.
Motonami, Masanao: *See*—
Suzuki, Ichiro; Motonami, Masanao; and Ogawa, Hisashi, 4,232,885, Cl. 280-804.000.
Motor Wheel Corporation: *See*—
Snyder, Robert C., 4,232,910, Cl. 303-96.000.
Motorola, Inc.: *See*—
Alberkrack, Jade H., 4,233,557, Cl. 323-9.000.
Chapman, Ronald H.; and Hansen, Kenneth A., 4,233,575, Cl. 331-111.000.
Chmura, Stanley J., 4,233,565, Cl. 329-50.000.
Motosugi, Katsuhiko: *See*—
Sumiyoshi, Masaharu; and Motosugi, Katsuhiko, 4,232,517, Cl. 60-276.000.
Motter, Manfred: *See*—
Koller, Josef; Horn, Ulrich; Moser, Peter; Motter, Manfred; and Galafassi, Pierre, 4,233,028, Cl. 8-534.000.
Moulton, Clifford H.: *See*—
Haddon, Merrill K.; and Moulton, Clifford H., 4,233,561, Cl. 324-326.000.
Muecke, Thomas W.: *See*—
Salathiel, William M.; Muecke, Thomas W.; Cooke, Claude E., Jr.; and Li, Norman N., 4,233,165, Cl. 252-8.55R.
Muehlthaler, Wolfgang: *See*—
Dudeck, Christian; Lehmann, Gunter; Petri, Norbert; Diem, Hans; Fliege, Werner; Meissner, Bernd; Ross, Karl-Heinz; and Muehlthaler, Wolfgang, 4,233,246, Cl. 568-402.000.
Mueller, Dale A., to Honeywell Inc. Heat pump system compressor start fault detector. 4,232,530, Cl. 62-160.000.
Mueller, Herbert; and Huchler, Otto H., to BASF Aktiengesellschaft. Purification of tetrahydrofuran. 4,233,228, Cl. 260-346.110.
Muelling, Earl L., to Earl Enterprises, Inc., The. Animal trap. 4,232,472, Cl. 43-61.000.

Muguruma, Yoshikata: *See*—
Kashihara, Manabu; Okamura, Kikuo; Muguruma, Yoshikata; Yamano, Shizuo; and Mizusawa, Shigeo, 4,232,561, Cl. 74-191.000.

Muller, Erwin: *See*—
Behnke, Reinhold; Wagenbach, Wolfgang; and Muller, Erwin, 4,232,925, Cl. 339-31.00R.

Muller, George H.; and Downs, William T., to A.I.R. Foundation. Bulk material retaining system having plural retainers. 4,232,803, Cl. 222-105.000.

Muller, Karl-Heinz, to Dr. Hans Boeckels GmbH & Co. Method of and apparatus for operating a dosing arrangement for good and poorly flowing loose material. 4,232,781, Cl. 198-505.000.

Muller, Lutz: *See*—
Schiweck, Hubert; Steinle, Georg; Muller, Lutz; Gau, Wolfgang; and Munir, Mohammad, 4,233,439, Cl. 536-4.000.

Munday, Thomas M.: *See*—
Harmon, George L.; Monroe, Ronald D.; Munday, Thomas M.; Jones, Clarence E.; and Baker, Edward B., 4,232,456, Cl. 35-25.000.

Munir, Mohammad: *See*—
Schiweck, Hubert; Steinle, Georg; Muller, Lutz; Gau, Wolfgang; and Munir, Mohammad, 4,233,439, Cl. 536-4.000.

Munk, Rudolf: *See*—
Hitschfel, Gerhard; Jurges, Peter; and Munk, Rudolf, 4,233,026, Cl. 8-52.000.

Munson, Robert E.: *See*—
Sanford, Gary G.; Munson, Robert E.; and Metzler, Thomas A., 4,233,607, Cl. 343-700.0MS.

Murata, Masami, to Kabushiki Kaisha Suwa Seikosha. Electronic timepiece. 4,233,681, Cl. 368-242.000.

Murata, Toshinori; Matsuura, Shigeo; Miyamoto, Hiroshi; and Akutsu, Eisaku, to Hitachi, Ltd. Digital-to-analog converter of the pulse width modulation type. 4,233,591, Cl. 340-347.0DA.

Murbach, Erwin: *See*—
Grunder, Werner; and Murbach, Erwin, 4,232,447, Cl. 33-147.00L.

Murray, John A., to U.S. Terrazzo Panels, Inc. Apparatus for the manufacture of concrete products. 4,233,008, Cl. 425-77.000.

Murrell, Lawrence L.; Kim, Chang J.; and Grenoble, Dane C., to Exxon Research & Engineering Co. Acid catalyzed hydrocarbon conversion processes utilizing a catalyst comprising a Group IVB, VB or VIB metal oxide on an inorganic refractory oxide support. 4,233,139, Cl. 208-112.000.

Muto, Masahito: *See*—
Ochiai, Takeshi; Muto, Masahito; Sakakibara, Naoji; and Kawata, Shoji, 4,232,757, Cl. 180-176.000.

Myers, Claude V.: *See*—
Glenn, Ronnie D.; and Myers, Claude V., 4,232,627, Cl. 440-61.000.

Myers, Philip A.; and Westlake, David J., to British Petroleum Company Limited, The. Heteropolysaccharide biopolymer. 4,233,438, Cl. 536-1.000.

Myodo, Osamu: *See*—
Tsuchihashi, Michihiro; Saito, Masato; Yamanoshita, Makota; Katsura, Hidetoshi; Myodo, Osamu; and Maeyama, Koichiro, 4,233,654, Cl. 362-231.000.

Naarden International N.V.: *See*—
Wieg, Andras J.; and Jackering, Gunther, 4,233,406, Cl. 435-275.000.

Nagai, Kenichi: *See*—
Inaba, Hideya; Nagai, Kenichi; Kamino, Yasumi; and Maeda, Kazuo, 4,233,183, Cl. 252-432.000.

Nagasaka, Takakazu; and Nakamura, Yasuhide, to Sharp Kabushiki Kaisha. Coin dispenser. 4,232,689, Cl. 133-4.00A.

Nagashima, Hironobu; Tuda, Koji; and Marui, Masatoshi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Larynx stroboscope for photography. 4,232,685, Cl. 128-773.000.

Nagata, Wataru: *See*—
Uyeo, Shoichiro; Yoshioka, Mitsuru; Tsuji, Teruji; Kikkawa, Ikuo; and Nagata, Wataru, 4,233,216, Cl. 260-239.00A.

Nagato, Nobuyuki; and Sugiyama, Yuichi, to Showa Denko Kabushiki Kaisha. Process for producing ketazine by reacting a ketone with ammonia and a peroxide. 4,233,242, Cl. 564-249.000.

Nagel, Karl; and Conzelmann, Gerhard, to Robert Bosch GmbH. Voltage regulator, particularly for automotive use. 4,233,556, Cl. 322-28.000.

Nakagawa, Jihei. Objective lens system for microscopes. 4,232,940, Cl. 350-175.0ML.

Nakahara, Yutaka: *See*—
Leistner, William E.; Minagawa, Motonobu; Nakahara, Yutaka; and Haruna, Tohru, 4,233,414, Cl. 525-146.000.

Nakahashi, Kenichi, to Olympus Optical Co., Ltd. Optical system of colposcope. 4,232,933, Cl. 350-19.000.

Nakamura, Akio: *See*—
Saito, Shunjiro; Aue, Kazuhide; Kobayashi, Makoto; and Nakamura, Akio, 4,233,340, Cl. 427-125.000.

Nakamura, Shigeharu: *See*—
Tamura, Masamitu; Yasuhara, Yukio; Nakamura, Shigeharu; Sakai, Masaru; Akagi, Kazuo; Kazihata, Ryohei; and Satohara, Norio, 4,233,108, Cl. 156-639.000.

Nakamura, Yasuhide: *See*—
Nagasaka, Takakazu; and Nakamura, Yasuhide, 4,232,689, Cl. 133-4.00A.

Nakano, Hideharu; and Sakata, Shinichi, to Matsushita Electric Works, Ltd. Assembling and energizing compact motors. 4,233,531, Cl. 310-42.000.

Nakano, Isamu: *See*—
Mimura, Masahisa; Nakano, Isamu; Okawa, Nobuo; and Tanaka, Atsushi, 4,233,359, Cl. 428-254.000.

Nakano, Keita; and Shibata, Yasuo, to Rank Xerox Limited. Recording head for electrostatic printing apparatus. 4,233,611, Cl. 346-155.000.

Nakano, Masahiko; and Miyauchi, Nobuaki, to Kyocera International, Inc. Integrated circuit lead coupling device and method. 4,232,815, Cl. 228-180.00A.

Nakano, Takashi: *See*—
Kitamura, Takashi; Watanabe, Asao; Nakano, Takashi; Masaki, Katsumi; Hirayama, Kazuhiro; Sato, Yasushi; and Tokiwa, Taisuke, 4,232,954, Cl. 354-7.000.

Nakao, Yoshiharu: *See*—
Kyomasu, Mikio; and Nakao, Yoshiharu, 4,233,616, Cl. 357-23.000.

Nakatsui, Hisashi: *See*—
Hirayama, Kazuhiro; Sato, Yasushi; Tokiwa, Taisuke; Kawakubo, Kazuo; Iwatate, Fujio; and Nakatsui, Hisashi, 4,233,612, Cl. 346-160.000.

Nakauchi, Shunsaku: *See*—
Okamoto, Hiroo; and Nakauchi, Shunsaku, 4,233,596, Cl. 340-578.000.

Nakayama, Yuya; Kunishima, Mamoru; Matsuda, Akira; and Takeuchi, Tomio, to Nippon Kayaku Kabushiki Kaisha. Coriolin derivatives. 4,233,224, Cl. 260-343.600.

Nalco Chemical Co.: *See*—
Ballweber, Edward G.; Jansma, Roger H.; and Phillips, Kenneth G., 4,233,411, Cl. 525-155.000.

Nanodata Corporation: *See*—
Kline, Mark H.; Liebel, John T., Jr.; and Sheridan, Ronald D., 4,232,924, Cl. 339-17.00L.

Napp Systems (USA) Inc.: *See*—
Okai, Sakuo; and Kimoto, Koichi, 4,233,391, Cl. 430-281.000.

Narayanswamy, Venkatachalam: *See*—
Menson, Robert C.; Narayanswamy, Venkatachalam; and Burns, Richard C., 4,233,403, Cl. 435-22.000.

Nasuno, Toyoaki: *See*—
Genjida, Fumihide; Nasuno, Toyoaki; Kobayashi, Hideo; and Ii, Motohiko, 4,233,170, Cl. 252-73.000.

Nath, Gunther. Apparatus for applying intense light radiation to a limited area. 4,233,493, Cl. 219-354.000.

National Research Development Corporation: *See*—
Allen, Edward A.; Phillips, Peter C.; and Smithson, Terence, 4,233,035, Cl. 44-73.000.
Samuelson, Kent M.; and Tuke, Michael A., 4,232,404, Cl. 3-1.910.
Soothill, John F.; and Levinsky, Roland J., 4,233,286, Cl. 424-12.000.
Twitchett, Peter J.; and Williams, Peter L., 4,233,030, Cl. 23-230.00R.

National Semiconductor Corporation: *See*—
Burdick, Edward J., 4,233,524, Cl. 307-205.000.
Karp, Joel A.; Lee, Ilbok; and Reed, John A., 4,233,675, Cl. 365-205.000.
Reyling, George F., Jr., 4,233,670, Cl. 365-15.000.

NCR Corporation: *See*—
Coleman, William E., 4,233,544, Cl. 315-169.200.

Nelson, James R.: *See*—
Vogelaar, Bernard F.; Warman, Bruce L.; and Nelson, James R., 4,233,040, Cl. 55-269.000.

Nelson, Norman A.: *See*—
Putch, Samuel W., 4,232,889, Cl. 285-141.000.

Nemas, Mara: *See*—
Kraus, Menahem A.; Frommer, Moshe A.; Nemas, Mara; and Gutman, Rodika, 4,233,434, Cl. 528-337.000.

Nemeth, Edward: *See*—
Lichtenstein, Bernard; and Nemeth, Edward, 4,232,443, Cl. 29-753.000.

Nestorovic, Mioljub, to Technical Audio Products Corporation. Distortion free power limiting and clipping prevention circuit. 4,233,566, Cl. 330-59.000.

Neubeck, Clifford E., to Rohm and Haas Company. Process for spray drying enzymes. 4,233,405, Cl. 435-187.000.

Neuner, Otto: *See*—
Dorlars, Alfons; and Neuner, Otto, 4,233,440, Cl. 542-458.000.

Newton, John E. Cervical support collar. 4,232,663, Cl. 128-75.000.

Nice, Ralph A.: *See*—
Hill, Robert C.; Nielson, Niel E.; Kreiling, Ronald L.; and Nice, Ralph A., 4,233,152, Cl. 210-703.000.

Niederhauser, Donald O., to Du Pont de Nemours, E. I., and Company. Suede-like product and process therefor. 4,233,349, Cl. 428-92.000.

Nieh, Edward C. Y.; and Keating, Kenneth P., to Texaco Development Corp. Process for purifying triethylenediamine. 4,233,447, Cl. 544-352.000.

Nielsen, Mogens B. Percussive tool shaft. 4,232,985, Cl. 408-226.000.

Nielson, Niel E.: *See*—
Hill, Robert C.; Nielson, Niel E.; Kreiling, Ronald L.; and Nice, Ralph A., 4,233,152, Cl. 210-703.000.

Nightingale Industries Limited: *See*—
Brown, Mortimer, 4,232,724, Cl. 160-135.000.

Nihon Beru-Haueru Kabushiki Kaisha (Bell & Howell Japan, Ltd.): *See*—
Saito, Koji, 4,233,503, Cl. 250-204.000.

Nihon Kogyo Kabushiki Kaisha: *See*—
Sato, Haruki; and Kawasumi, Yoshio, 4,233,254, Cl. 264-37.000.

Nikitin, Mikhail D.: *See*—
Shalai, Alexandr N.; Nikitin, Mikhail D.; Zakharov, Nikolai I.; and Bratchenko, Anatoly P., 4,233,490, Cl. 219-121.00P.

Nilsson, Bengt, to Lidkopings Mekaniska Verkstads AB. Restrictor for a bearing pocket in a hydrostatic bearing. 4,232,913, Cl. 308-9.000.
Nippon Electric Co., Ltd.: *See—*
Hishinuma, Esao; Tomimori, Akinobu; and Hara, Hiroshi, 4,233,474, Cl. 179-81.00B.
Kurogi, Yukinori; and Sugibuchi, Kiyoshi, 4,233,526, Cl. 307-238.000.
Maehashi, Yukio; and Kosaka, Hidetoshi, 4,233,665, Cl. 364-715.000.
Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Uchiyama, Yasuji, 4,232,581, Cl. 84-1.030.
Nippon Kayaku Kabushiki Kaisha: *See—*
Nakayama, Yuya; Kunishima, Mamoru; Matsuda, Akira; and Takeuchi, Tomio, 4,233,224, Cl. 260-343.600.
Nippon Kokan Kabushiki Kaisha: *See—*
Sato, Kunihiko; Urata, Tetsuro; Asamoto, Tetsuhiro; Asakawa, Kobun; Uebayashi, Takeo; and Kawano, Mitugi, 4,233,485, Cl. 219-69.00M.
Nippon Oil Co., Ltd.: *See—*
Tsuchiya, Shozo; Hayashi, Hideo; Sasaki, Makoto; Goto, Kiyoshi; and Ihida, Kazuyoshi, 4,233,420, Cl. 525-310.000.
Nippon Soken, Inc.: *See—*
Okumura, Kazunari; Yamamoto, Shinichi; and Suzuki, Zituo, 4,233,351, Cl. 428-116.000.
Tsuge, Noboru; Kuwakado, Satosi; Takei, Toshihiro; and Shimogawa, Toshiaki, 4,232,886, Cl. 280-806.000.
Yamaguchi, Hiroaki; Hattori, Tadashi; Nishida, Minoru; Goto, Kenji; Sawada, Daisaku; and Shigematu, Takashi, 4,232,642, Cl. 123-416.000.
Nippon Telegraph and Telephone Public Corporation: *See—*
Furukawa, Kazuo; and Furukawa, Sumio, 4,233,669, Cl. 365-15.000.
Yamaguchi, Nakahiko; Hibi, Susumu; Yoshizawa, Shigeru; Yoshimoto, Shoji; and Kobayashi, Akira, 4,233,668, Cl. 365-1.000.
Yamamoto, Hideaki; Matsui, Makoto; Tsukada, Toshihisa; Eto, Yoshizumi; Hirai, Tadaaki; and Maruyama, Eiichi, 4,233,506, Cl. 250-227.000.
Nippondenso Co., Ltd.: *See—*
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Pietratus, Udo; and Rothemeyer, Fritz, to Continental Gummi-Werke Aktiengesellschaft. Method of and apparatus for producing profiled strands from elastomeric material. 4,233,259, Cl. 264-167.000.

Pilkington P. E. Limited: *See—*
Rogers, Phillip J., 4,232,943, Cl. 350-202.000.

Pillette, Kibbie P. Leak detection system and control using non-rigid bladder. 4,232,736, Cl. 166-53.000.

Pilz, Georg: *See—*
Rotzoll, Rudi-Heinz; Duffner, Paul; Dietl, Ernst; Pilz, Georg; and Thiel, Gerhard, 4,233,234, Cl. 260-501.200.

Pioneer Electronic Corporation: *See—*
Sato, Reisuke, 4,233,505, Cl. 250-214.00R.

Piotrowski, Tadeusz, to Etablissement Euroburner. Thermal exchanger. 4,232,733, Cl. 165-89.000.

Pirkle, Sherman J., to Hewlett-Packard Company. Defibrillator charging current regulator. 4,233,659, Cl. 363-134.000.

Pisarevskij, Jurij V.: *See—*
Barta, Cestmir; Ctyroky, Jiri; Silvestrova, Iraida M.; and Pisarevskij, Jurij V., 4,232,952, Cl. 350-358.000.

Pissiotas, Georg: *See—*
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Szczepanski, Henry; Rohr, Otto; Pissiotas, Georg; Bohner, Beat; and Rempfler, Hermann, 4,233,054, Cl. 71-70.000.

Plaiss, Charles E. Wheeled vehicle lock. 4,232,537, Cl. 70-233.000.

Plass, Vernon F. Apparatus for destructive distillation of cellulosic materials. 4,233,024, Cl. 432-72.000.

Plaster, Ronnie C. Automatic car coupler. 4,232,794, Cl. 213-179.000.

Platt, Michael H.: *See—*
Frissora, Joseph R.; and Platt, Michael H., 4,232,655, Cl. 126-420.000.

Player, Duane W.; and Weil, James A., to Minneapolis Electric Steel Castings Company. Roll crusher. 4,232,834, Cl. 241-293.000.

Plempel, Manfred: *See—*
Kramer, Wolfgang; Buchel, Karl H.; Plempel, Manfred; and Haller, Ingo, 4,233,311, Cl. 424-273.00R.

Plumet, Lucien, to Solvay & Cie. Process for dispersing finely divided particles in an aqueous medium. 4,233,081, Cl. 106-214.000.

Pohanka, Robert C.: *See—*
Rice, Roy W.; and Pohanka, Robert C., 4,233,477, Cl. 179-110.00A.

Poliak, Richard M.: *See—*
Darrow, Russell E.; Memis, Irving; and Poliak, Richard M., 4,233,620, Cl. 357-74.000.

Pollman, Frederic W.: *See—*
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Polychrome Corporation: *See—*
Jargiello, Paul, 4,233,390, Cl. 430-156.000.

Pontius, Duane H.; and Smith, Wallace B., to United States of America, Administrator U.S. Environmental Protection Agency. Method of and apparatus for reducing back corona effects. 4,233,037, Cl. 55-2.000.

Popov, Alexei N.: *See—*
Grachev, Konstantin A.; Berber, Viktor A.; Sokolov, Viktor E.; Pavlov, Vladimir V.; Popov, Alexei N.; and Zolotenko, Vladimir A., 4,232,967, Cl. 356-336.000.

Possell, Clarence R. Geothermal turbine and method of using the same. 4,232,992, Cl. 415-90.000.

Potter, James C.; and Sosnowski, Stanislaw J. A., to Lucas Industries Limited. Fuel pumping apparatus. 4,232,644, Cl. 123-450.000.

Pouget, Rene, to Aciers et Outillage Peugeot. Electric inertia-type starter device for a heat engine. 4,233,521, Cl. 290-38.00B.

PPG Industries, Inc.: *See—*
Comperatore, John A.; Wise, David J.; and Black, Edward D., 4,233,050, Cl. 65-107.000.
Cuevas, Ephraim A., 4,232,902, Cl. 299-4.000.
Gintert, Dean W., 4,233,048, Cl. 65-27.000.
Hazel, John G., 4,233,077, Cl. 106-43.000.
Lavanish, Jerome M., 4,233,057, Cl. 71-090.000.
Seymour, Samuel L., 4,233,049, Cl. 65-106.000.
Sheppard, Robert S., 4,233,277, Cl. 423-297.000.
Stultz, James C.; and Pecoraro, George A., 4,233,047, Cl. 65-27.000.
Walser, Douglas M., 4,233,046, Cl. 65-3.00C.

Pracht, Hans J.; and Nirschl, Joseph P., to Procter & Gamble Company, The. Process for making imidazolinium salts. 4,233,451, Cl. 548-354.000.

Pragnell, Robert J.: *See—*
Taylor, Rodney; Pragnell, Robert J.; and Sheppard, John P., 4,233,357, Cl. 428-245.000.

Presley, Charles L., to Kobe, Inc. Method for treating petroleum well pumping power fluid. 4,233,154, Cl. 210-800.000.

Preston, Ronald: *See—*
Cubbon, Robert C. P.; Braid, John E.; Oates, Alfred E.; and Preston, Ronald, 4,233,462, Cl. 568-564.000.

Prevignano, Paolo: *See—*
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Price, Barry J.: *See—*
Martin-Smith, Michael; Price, Barry J.; Bradshaw, John; and Clitherow, John W., 4,233,302, Cl. 424-251.000.

Prime Manufacturing Corporation: *See—*
Burris, Robert E.; and Budyak, Robert J., 4,232,696, Cl. 137-62.000.

Prince, Anthony P., to Outboard Marine Corporation. Single lever remote control. 4,232,771, Cl. 192-0.096.

Prince, Luther T., Jr.; Hampel, Wilbur J.; and Boot, Michael A., to Ault, Inc. Automatic dual mode battery charger. 4,233,553, Cl. 320-23.000.

Procter & Gamble Company, The: *See—*
Camden, James B.; and McCarty, Mark L., 4,233,235, Cl. 260-502.00R.
Chutter, Raymond A., 4,232,977, Cl. 401-68.000.
Fawzi, Mahdi B., 4,233,284, Cl. 424-1.000.
Lucas, Malcolm B.; and Van Coney, Robert H., 4,233,017, Cl. 425-290.000.
Pracht, Hans J.; and Nirschl, Joseph P., 4,233,451, Cl. 548-354.000.

Proctor & Gamble Company, The: *See—*
Davis, James E., 4,233,164, Cl. 252-8.800.

Products of Advanced Technology, Inc.: *See—*
Hosterman, Craig; and Kerwin, William J., 4,232,698, Cl. 137-68.00R.

Produits Chimiques Ugine Kuhlmann: *See—*
Koeppel, Robert, 4,233,080, Cl. 106-87.000.
Ricard, Jean; and Excoffon, Charles, 4,233,338, Cl. 427-85.000.

Prohazka, George J., to Combustion Engineering, Inc. Maintenance platform built upon retractable support beams. 4,232,636, Cl. 122-479.00R.

Prud'Homme, Christian: *See—*
Bargain, Michel; and Prud'Homme, Christian, 4,233,427, Cl. 525-478.000.

Pullman Incorporated: *See—*
Hallam, Keith J.; and Marsden, Dennis B., 4,232,793, Cl. 213-43.000.
Miller, Roy W., 4,232,989, Cl. 414-387.000.

Pulp and Paper Research Institute of Canada: *See—*
Rogers, James H.; and Butler, Donald J., 4,233,600, Cl. 340-683.000.

Purdie, Anthony F.: *See—*
Arthurs, Eugene G.; and Purdie, Anthony F., 4,233,572, Cl. 331-94.50M.

Putch, Samuel W., to Nelson, Norman A., a part interest. Recockable well hanger. 4,232,889, Cl. 285-141.000.

Pyle, Walter R., to Chevron Research Company. Coaxial vapor recovery nozzle. 4,232,715, Cl. 141-1.000.

Pyott-Boone Machinery Corp.: *See—*
Teti, John J., 4,232,930, Cl. 339-186.00M.

Pyschik, Werner: *See—*
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Quaglia, Giorgio: *See—*
Ferrari, Lorenzo; Dell'Acqua, Ernani; and Quaglia, Giorgio, 4,233,290, Cl. 424-94.000.

R. A. Jones & Co. Inc.: *See—*
Dieterlen, Paul E.; and Benner, Harold T., Jr., 4,232,504, Cl. 53-570.000.

Radford, Herschel D.: *See—*
D'Souza, Gerard J.; and Radford, Herschel D., 4,233,276, Cl. 423-230.000.

Ragi, Elias G.: *See—*
Fenner, Gary W.; and Ragi, Elias G., 4,232,728, Cl. 165-1.000.

Raines, Dale A.; and Ainsworth, Oliver C., to Dow Chemical Company, The. Ethylene carbonate process. 4,233,221, Cl. 260-340.200.

Ralph M. Parsons Company, The: *See—*
Beavon, David K.; and Mackles, Mark, 4,233,141, Cl. 208-236.000.

Ramanathan, Sivam: *See—*
Chalon, Jack; Ramanathan, Sivam; and Turndorf, Herman, 4,232,667, Cl. 128-203.260.

Rampe, John F., to Rampe Research. Tumbler-type finishing machine. 4,232,486, Cl. 51-164.100.

Rampe Research: *See—*
Rampe, John F., 4,232,486, Cl. 51-164.100.

Ramsey, David E.; and Grindstaff, Lloyd I., to Great Lakes Carbon Corporation. Electrode composition. 4,233,148, Cl. 204-291.000.

Randall, Cyril A.: *See—*
Becker, Bernard S.; Bowman, John K.; and Randall, Cyril A., 4,232,704, Cl. 137-218.000.

Randlett, M. Ronald: *See—*
Bower, Terry F.; Randlett, M. Ronald; and Shinopulos, George, 4,232,727, Cl. 164-76.000.

Rank Xerox Limited: *See—*
Nakano, Keita; and Shibata, Yasuo, 4,233,611, Cl. 346-155.000.

Rao, V. N. Mallikarjuna; and Ziemecki, Stanislaw B., to Du Pont de Nemours, E. I., and Company. Process for oxidation of methanol to formaldehyde with nitrous oxide. 4,233,248, Cl. 568-487.000.

Rasberger, Michael: *See—*
Rody, Jean; and Rasberger, Michael, 4,233,410, Cl. 525-123.000.
Rody, Jean; and Rasberger, Michael, 4,233,412, Cl. 525-167.000.

Ratcliffe, Charles T.; and Yardley, James T., to Allied Chemical Corporation. Process for preparing alkylene episulfides and episelenides. 4,233,131, Cl. 204-162.00R.

Rausing, Hans A.: *See—*
Monaco, Jose R.; and Rausing, Hans A., 4,233,320, Cl. 426-7.000.

Raveglia, Dalmazio; Lonati, Carlo; and Macchi, Giancarlo, to Societa Italiana Telecomunicazioni Siemens S.p.A. Flat transmission path for communication system. 4,233,577, Cl. 333-136.000.

Rawson, Eric G.; and Metcalfe, Robert M., to Xerox Corporation. Active T-coupler for fiber optic local networks which permits collision detection. 4,233,589, Cl. 340-147.00R.

Ray, Robert T., Sr.; and Pickett, Richard G., to Aqua-Retain Valve, Inc. Flow regulating device. 4,232,711, Cl. 138-44.000.

Raychem Limited: *See—*
Squires, David T., 4,232,712, Cl. 138-109.000.

Raytheon Company: *See—*
Moran, Robert L.; and O'Hara, Francis J., 4,233,608, Cl. 343-728.000.

RCA Corporation: *See—*
Bell, Alan E., 4,233,626, Cl. 358-128.500.
Botez, Dan; Ettenberg, Michael; and Kressel, Henry, 4,233,614, Cl. 357-17.000.
Groeneweg, Willem H., 4,233,622, Cl. 358-11.000.
Hawrylo, Frank Z.; and Kressel, Henry, 4,233,090, Cl. 148-171.000.
Hinn, Werner; and Hinderling, Jurg, 4,233,624, Cl. 358-65.000.
Strother, John A., 4,233,501, Cl. 250-203.00R.
Webb, Paul P.; and McIntyre, Robert J., 4,233,619, Cl. 357-74.000.

Rechter, Harold L., to Chicago Fire Brick Company. Aluminous refractory compositions containing carbon, silicon and chrome oxide. 4,233,079, Cl. 106-56.000.

Redey, Laszlo: *See—*
Szebenyi nee Gyori, Eniko; Kovacs nee Mindler, Vera; Redey, Laszlo; and Szemos nee Szonyi, Agnes, 4,233,121, Cl. 204-59.00R.

Redwine, Terry W., to Du Pont de Nemours, E. I., and Company. Butadiene chlorination process. 4,233,252, Cl. 570-231.000.

Reed, John A.: *See—*
Karp, Joel A.; Lee, Ilbok; and Reed, John A., 4,233,675, Cl. 365-205.000.

Reese, Stanton L. Radioactive materials transporting container and vehicles. 4,232,730, Cl. 165-41.000.

Regie Nationale des Usines Renault: *See—*
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Welling, Conrad G.; Davenport, Gordon H.; Reichert, Guenter; Snyder, Charles M.; Harrold, Milton C.; Donze, Salvatore H.; and Larsen, Frank R., 4,232,903, Cl. 299-8.000.

Reider, Samuel B., to General Motors Corporation. Combustor liner joints. 4,232,527, Cl. 60-754.000.

Reiff, Gunther: *See—*
Idel, Karsten; Vernaleken, Hugo; Freitag, Dieter; Reiff, Gunther; and Rudolph, Hans, 4,233,431, Cl. 525-462.000.

Reiman, Walter C.: *See—*
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Rein, Arnold R.: *See—*
Ticknor, William G.; and Rein, Arnold R., 4,233,367, Cl. 428-476.300.

Reiner, Alberto, to Crinos Industria Farmacobiologica S.p.A. Pyridoxine derivatives. 4,233,304, Cl. 424-256.000.

Reinert, Norbert: *See—*
Hatje, Erich; and Reinert, Norbert, 4,232,734, Cl. 165-118.000.

Reinhardt, John H. Collapsible column with covered tray. 4,232,917, Cl. 312-128.000.

Reisberg, Joseph: *See—*
Richardson, Edwin A.; Scheuerman, Ronald F.; Berkshire, David C.; Reisberg, Joseph; and Lybarger, James H., 4,232,741, Cl. 166-281.000.

Reliable Electric Company: *See—*
Baumbach, Bertram W., 4,233,641, Cl. 361-119.000.

Remick, David W.; and Ahlgren, David T., to O. M. Edwards Co. Drying apparatus for multi-glazed window unit. 4,232,492, Cl. 52-172.000.

Rempfler, Hermann: *See—*
Boner, Beat; Rohr, Otto; Rempfler, Hermann; and Pissiotas, Georg, 4,233,060, Cl. 71-94.000.
Szczepanski, Henry; Rohr, Otto; Pissiotas, Georg; Bohner, Beat; and Rempfler, Hermann, 4,233,054, Cl. 71-70.000.

Rengo Kabushiki Kaisha (Rengo Co., Ltd.): *See—*
Tokuno, Masateru, 4,232,859, Cl. 271-35.000.

REPA Feinstanzwerk GmbH: *See—*
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Restaurant Technology, Inc.: *See—*
Kroll, Steve; and Schindler, James C., 4,232,596, Cl. 99-410.000.

Reuter, Franz G.; and Menzel, Tankred, to Reuter Technologie GmbH. Electrically conductive plastics materials and process for their production. 4,233,191, Cl. 252-511.000.

Reuter Technologie GmbH: *See—*
Reuter, Franz G.; and Menzel, Tankred, 4,233,191, Cl. 252-511.000.

Revah, Isaac R.: *See—*
Leung, Ernest C.; and Revah, Isaac R., 4,233,646, Cl. 361-399.000.

Reyling, George F., Jr., to National Semiconductor Corporation. Fault transparent magnetic bubble memory. 4,233,670, Cl. 365-15.000.

Reynolds, George A.: *See—*
Petropoulos, Constantine C.; Reynolds, George A.; and VanAllan, James A., 4,233,443, Cl. 542-454.000.

Reynolds Metals Company: *See—*
Mills, W. Ralph, 4,233,195, Cl. 260-23.00S.

Rhone-Poulenc Industries: *See—*
Bargain, Michel; and Prud'Homme, Christian, 4,233,427, Cl. 525-478.000.
Blanc, Jean-Pierre; and Meiller, Francois, 4,233,076, Cl. 106-38.350.
Otton, Jean, 4,233,230, Cl. 260-410.90R.

Ricard, Jean; and Excoffon, Charles, to Produits Chimiques Ugine Kuhlmann. Processes for deposition of thin films of crystalline silicon on graphite. 4,233,338, Cl. 427-85.000.
Rice, Roy W.; and Pohanka, Robert C., to United States of America, Navy. Flexible, shapeable, composite acoustic transducer. 4,233,477, Cl. 179-110.00A.
Richard, Jean-Claude: *See—*
Hurlow, Gerald S.; Blain, Jean R.; Coombes, Michael; Richard, Jean-Claude; and Hitchinson, Patrick W., 4,232,598, Cl. 99-483.000.
Richardson, Edwin A.; Scheuerman, Ronald F.; Berkshire, David C.; Reisberg, Joseph; and Lybarger, James H., to Shell Oil Company. Temporarily plugging a subterranean reservoir with a self-foaming aqueous solution. 4,232,741, Cl. 166-281.000.
Richens, Jack W.: *See—*
Allgaier, Joseph M.; Richens, Jack W.; and Leekha, Rajendra K., 4,232,717, Cl. 141-179.000.
Richter, Karl M.; Harder, Hans E.; and Behrens, Klaus, to Howmedica International, Inc. Zweigniederlassung. Tube type supply container for medical syringe. 4,232,670, Cl. 128-224.000.
Richter, Siegfried; and Vinkovic, Josef, to Swiss Aluminum Ltd. Process for etching and preparing nickel-polyester offset printing plates. 4,233,110, Cl. 156-656.000.
Richters, Johannes J.: *See—*
Maciorewicz, Jacek J.; Richters, Johannes J.; and St. John, James E., 4,233,160, Cl. 210-512.00M.
Ricoh Company, Ltd.: *See—*
Harada, Masahide; and Mochizuki, Manabu, 4,233,511, Cl. 250-325.000.
Koike, Tadao, 4,232,963, Cl. 355-49.000.
Riecker, Johann G.; and Schroter, Horst, to Hartung, Kuhn & Co. Maschinenfabrik GmbH. Equipment for collecting, extracting and purifying foul gases arising on the coke side of a battery of chamber coke-ovens with vertical flue. 4,233,118, Cl. 202-230.000.
Riedel-de Haen Aktiengesellschaft: *See—*
Schmand, Horst; and Dannenberg, Wolfgang, 4,233,456, Cl. 562-401.000.
Riken Corporation: *See—*
Watanabe, Tamotu; Sakata, Tatsuei; and Mizuma, Yoshikuni, 4,233,072, Cl. 75-236.000.
Riken Piston Ring Industrial Co., Ltd.: *See—*
Takemura, Kazutoshi, 4,233,073, Cl. 75-243.000.
Ringe, Stephen J., to Fruehauf Corporation. Door hardware with positive torque. 4,232,891, Cl. 292-218.000.
Ritsko, Joseph E.; Culkin, John J.; MacInnis, Martin B.; and Acla, Howard L., to GTE Products Corporation. Process for producing cobalt powder. 4,233,063, Cl. 75-0.5AA.
Ritter, Alfred E.; and Kleinwachter, Jurgen, to Max-Planck-Gesellschaft zur Fordenung der Wissenschaften e.V. Heat collector system. 4,232,820, Cl. 237-2.00B.
Rizzi, Luigi: *See—*
Lupatin, Elio; and Rizzi, Luigi, 4,233,658, Cl. 363-26.000.
Roach, Herschel, to O & R Products, Incorporated. Fitness bar. 4,232,863, Cl. 272-111.000.
Robbins, Michael B.: *See—*
Cottrell, Edward D.; and Robbins, Michael B., 4,232,811, Cl. 227-117.000.
Roberge, Frank L., to Garrett Corporation, The. Fluid control valve and method. 4,232,695, Cl. 137-1.000.
Robert Bosch GmbH: *See—*
Dobler, Klaus; Zrenner, Christian; Schirmer, Gunter; and Kizler, Alfred, 4,232,545, Cl. 73-35.000.
Fussner, Paul, 4,233,584, Cl. 335-260.000.
Nagel, Karl; and Conzelmann, Gerhard, 4,233,556, Cl. 322-28.000.
Rohrbach, Fritz, 4,232,749, Cl. 173-48.000.
Roberts, Donald E., to Hillside Engineering, Inc. Presorted flatware washing method and apparatus. 4,233,083, Cl. 134-25.200.
Robinson, Ivan M., to Du Pont de Nemours, E. I., and Company. Block polymers of hydroxyalkyl phthalate esters and tetrahydrofuran/alkylene oxide copolymers. 4,233,436, Cl. 528-366.000.
Roche, Bernard G. Telephone station with automatic switch-over between pulse code dialling and multifrequency code dialling. 4,233,475, Cl. 179-84.0VF.
Roche, Elizabeth M. Multi-functional convertible garment. 4,232,402, Cl. 2-93.000.
Roche, Lawrence R., to Dyna Technology, Inc. Alternating current generator for providing three phase and single phase power at different respective voltages. 4,233,555, Cl. 322-25.000.
Rockwell International Corporation: *See—*
Vasile, Carmine F., 4,232,557, Cl. 73-629.000.
Roderick, Guy A.; and Locke, Peter, to Photon Power, Inc. Solar panel module. 4,233,085, Cl. 136-244.000.
Rody, Jean; and Rasberger, Michael, to Ciba-Geigy Corporation. Polymeric light stabilizers for plastics. 4,233,410, Cl. 525-123.000.
Rody, Jean; and Rasberger, Michael, to Ciba-Geigy Corporation. Polymeric light stabilizers for plastics. 4,233,412, Cl. 525-167.000.
Roethlein, Richard J.: *See—*
Breault, Richard D.; Roethlein, Richard J.; and Congdon, Joseph V., 4,233,369, Cl. 429-26.000.
Rogers, Edward J., to S&C Electric Company. Apparatus for connecting a switch operator to a switch. 4,233,483, Cl. 200-337.000.
Rogers, Howard H.: *See—*
Lim, Hong S.; Rogers, Howard H.; and Verzwyvelt, Scott A., 4,233,347, Cl. 427-352.000.
Rogers, James H.; and Butler, Donald J., to Pulp and Paper Research Institute of Canada. Method and system for detecting plate clashing in disc refiners. 4,233,600, Cl. 340-683.000.
Rogers, Phillip J., to Pilkington P. E. Limited. Modified Petzval lens. 4,232,943, Cl. 350-202.000.
Rohm GmbH: *See—*
Fink, Herbert; Grumbach, Egon; and Pennewiss, Horst, 4,233,200, Cl. 260-33.8UA.
Rohm and Haas Company: *See—*
Kilbourn, Edward E.; Weiler, Ernest D.; and Weir, William D., 4,233,289, Cl. 424-84.000.
Neubeck, Clifford E., 4,233,405, Cl. 435-187.000.
Novak, Ronald W.; and Kine, Benjamin B., 4,233,362, Cl. 428-332.000.
Rohner, Joachim; Mauries, Reinhard; and Zumfeld, Heinz, to W. Schlafhorst & Co. Method and device for joining an upper thread to a lower thread. 4,232,509, Cl. 57-261.000.
Rohner, Peter; and Still, Michael, to Kabel- und Metallwerke Gutehoffnungshuette AG. Communications cable with optical waveguides. 4,232,935, Cl. 350-96.230.
Rohowetz, Stanley E.: *See—*
Lemke, Harold C.; and Rohowetz, Stanley E., 4,233,331, Cl. 426-407.000.
Rohr, Franz-Josef; and Holick, Hubert, to Brown, Boveri & Cie Aktiengesellschaft. Electrochemical measuring cell. 4,233,142, Cl. 204-195.00S.
Rohr, Otto: *See—*
Boner, Beat; Rohr, Otto; Rempfler, Hermann; and Pissiotas, Georg, 4,233,060, Cl. 71-94.000.
Szczepanski, Henry; Rohr, Otto; Pissiotas, Georg; Bohner, Beat; and Rempfler, Hermann, 4,233,054, Cl. 71-70.000.
Rohrbach, Fritz, to Robert Bosch GmbH. Convertible rotary/percussion drill. 4,232,749, Cl. 173-48.000.
Rollmann, Louis D.; and Walsh, Dennis E., to Mobil Oil Corporation. Process for the visbreaking of high-metals crudes and resids. 4,233,138, Cl. 208-106.000.
Rolls-Royce Limited: *See—*
Lewis, William J.; Harper, Leslie R.; Davis, Malcolm J.; and Gardiner, Richard G., 4,232,516, Cl. 60-226.00A.
Pearson, Kenneth A.; and Moorhouse, Major D., 4,232,513, Cl. 60-39.09R.
Roman, Gian F., to Claber S.p.A. Rocking-arm lawn sprinkler. 4,232,827, Cl. 239-242.000.
Rooney, Clarence S.: *See—*
Williams, Haydn W. R.; Cragoe, Edward J., Jr.; and Rooney, Clarence S., 4,233,452, Cl. 549-79.000.
Roscetti, Thomas L.: *See—*
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Rosenfeld, Robert B., to Eastman Kodak Company. Ultrasonographic exposure apparatus. 4,232,555, Cl. 73-606.000.
Ross, Karl-Heinz: *See—*
Dudeck, Christian; Lehmann, Gunter; Petri, Norbert; Diem, Hans; Fliege, Werner; Meissner, Bernd; Ross, Karl-Heinz; and Muehlthaler, Wolfgang, 4,233,246, Cl. 568-402.000.
Ross, William A.; and Pollman, Frederic W., to Sundstrand Corporation. Engine-transmission control system. 4,232,572, Cl. 74-859.000.
Roth, Jacques. Auto-expansible cushioning bag. 4,232,788, Cl. 206-524.000.
Rothemeyer, Fritz: *See—*
Pietratus, Udo; and Rothemeyer, Fritz, 4,233,259, Cl. 264-167.000.
Rothgordt, Ulf: *See—*
Hinz, Hans-Dieter; Rothgordt, Ulf; and Schinke, Franz, 4,233,385, Cl. 430-117.000.
Rothmayer, Noel Y.; Keusch, Preston; and Kattermann, Dietrich E., to Allied Chemical Corporation. Cell flow distributors. 4,233,146, Cl. 204-255.000.
Rotzoll, Rudi-Heinz; Duffner, Paul; Dietl, Ernst; Pilz, Georg; and Thiel, Gerhard, to BASF Aktiengesellschaft. Continuous manufacture of an aqueous solution of a salt of an alkanedicarboxylic acid and an alkanediamine. 4,233,234, Cl. 260-501.200.
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Allais, Andre; Meier, Jean; and Deraedt, Roger, 4,233,305, Cl. 424-258.000.
Allais, Andre; Meier, Jean; and Deraedt, Roger, 4,233,312, Cl. 424-274.000.
Franck-Neumann, Michel; Dietrich-Buchecker, Christiane; and Miesch, Michel, 4,233,129, Cl. 204-158.00R.
Teutsch, Jean G.; and Philibert, Daniel, 4,233,296, Cl. 424-241.000.
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Rubel, Peter A., to Rule Industries. Amine-promoted, peroxide-cured polyester composition. 4,233,204, Cl. 260-40.00R.
Rudolph, Hans: *See—*
Idel, Karsten; Vernaleken, Hugo; Freitag, Dieter; Reiff, Gunther; and Rudolph, Hans, 4,233,431, Cl. 525-462.000.
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Rule Industries: *See—*
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Rupert, Robert E., to Anderson, Norman C. Thermometer for remotely measuring temperature. 4,233,512, Cl. 250-338.000.

Rupprecht, Kurt, to Volkswagenwerk Aktiengesellschaft. Drum brake 4,232,765, Cl. 188-78.000.

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Rusch, Reinhart: *See—*
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Barbakadze, Dzhondo F.; Mindeli, Mamuka S.; Macharashvili, Petr G.; Rusidze, Vazha V.; and Suladze, Otari N., 4,232,854, Cl. 266-266.000.

Russ, Karl J.; and Broughton, Donald R., to United Catalysts Inc. Process for steam reforming of hydrocarbons. 4,233,179, Cl. 252-373.000.

Russell, B. Carson, to Carlson Stapler and Shippers Supply, Inc. String stapler. 4,232,810, Cl. 227-19.000.

Russell, Lewis K.; and Kleitman, David, to Signetics Corporation. Method of configuring an integrated circuit. 4,233,674, Cl. 365-200.000.

Rustler, Hubert: *See—*
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Rutgaizer, Mikhail I.: *See—*
Antipov, Georgy A.; Gelfand, Mikhail L.; Goldshtein, Boris G.; Rutgaizer, Mikhail I.; Suut, Nikolai K.; Tsipenjuk, Yakov I.; Shishulin, Jury P.; Galimov, Apas G.; Sutyagin, Oleg Y.; and Yankovsky, Oleg A., 4,232,750, Cl. 173-93.600.

Rysti, Alpo. Timber-conveying method and apparatus. 4,232,778, Cl. 198-443.000.

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Rogers, Edward J., 4,233,483, Cl. 200-337.000.

S. C. Johnson & Son, Inc.: *See—*
Sramek, John A., 4,233,167, Cl. 252-8.750.

S K M, Societe Anonyme: *See—*
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SAFT-Societe des Accumulateurs Fixes et de Traction: *See—*
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Sagi, Yasuo: *See—*
Ozaki, Kiyoji; Fukuhara, Akinobu; Hosoi, Takuji; and Sagi, Yasuo, 4,233,137, Cl. 208-48.00Q.

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Sahoo, Maheswar: *See—*
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St. Clair, Terry L., to United States of America, National Aeronautics and Space Administration. Method for preparing addition type polyimide prepregs. 4,233,258, Cl. 264-137.000.

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Maciorewicz, Jacek J.; Richters, Johannes J.; and St. John, James E., 4,233,160, Cl. 210-512.00M.

Saito, Koji, to Nihon Beru-Haueru Kabushiki Kaisha (Bell & Howell Japan, Ltd.). Automatic focus adjusting system. 4,233,503, Cl. 250-204.000.

Saito, Masato: *See—*
Tsuchihashi, Michihiro; Saito, Masato; Yamanoshita, Makota; Katsura, Hidetoshi; Myodo, Osamu; and Maeyama, Koichiro, 4,233,654, Cl. 362-231.000.

Saito, Shunjiro; Aue, Kazuhide; Kobayashi, Makoto; and Nakamura, Akio, to TDK Electronics Company, Limited. Process for preparing insoluble electrode. 4,233,340, Cl. 427-125.000.

Sakai, Masaru: *See—*
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Sakakibara, Naoji: *See—*
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Sakakura, Mitsuo; and Takaku, Tetsuo, to Toko, Inc. Method of fabricating piezoelectric thin film. 4,233,135, Cl. 204-192.0SP.

Sakata, Shinichi: *See—*
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Sakata, Tatsuei: *See—*
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Sakurai, Masahiro: *See—*
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Salathiel, William M.; Muecke, Thomas W.; Cooke, Claude E., Jr.; and Li, Norman N., to Exxon Production Research Company. Well treatment with emulsion dispersions. 4,233,165, Cl. 252-8.55R.

Salino, Michael A.: *See—*
Butcher, John A. W.; and Salino, Michael A., 4,233,471, Cl. 178-69.00G.

Sample, Thomas E., Jr.; and Horn, John M., to Dresser Industries, Inc. Silane coated silicate minerals and method for preparing same. 4,233.366, Cl. 428-405.000.

Samuelson, Kent M.; and Tuke, Michael A., to National Research Development Corporation. Endoprosthetic ankle joint. 4,232,404, Cl. 3-1.910.

Sanada, Sei: *See—*
Sugawara, Kazuo; Sanada, Sei; and Kobayashi, Yosiharu, 4,233,663, Cl. 364-515.000.

Sandahl, Evert G. I., to Cementa AB. Method of anchoring elements and a device for carrying out said method. 4,232,984, Cl. 405-261.000.

Sandoz, Inc.: *See—*
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Sandoz Ltd.: *See—*
Hochreuter, Richard; and Runyon, James R., 4,233,193, Cl. 260-18.00N.

Sanford, Gary G.; Munson, Robert E.; and Metzler, Thomas A., to Ball Corporation. Apparatus and method for improving r.f. isolation between adjacent antennas. 4,233,607, Cl. 343-700.0MS.

Sanger, Winston D. Articulated plumbers snake. 4,232,419, Cl. 15-104.3SN.

Sante Fe International Corporation: *See—*
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Santen Pharmaceutical Co., Ltd.: *See—*
Fujita, Tadashi; Oya, Masayuki; Watanabe, Toshio; and Chiba, Takehisa, 4,233,310, Cl. 424-273.00R.

Santilli, Arthur A.: *See—*
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Sanyo Chemical Industries, Limited: *See—*
Genjida, Fumihide; Nasuno, Toyoaki; Kobayashi, Hideo; and Ii, Motohiko, 4,233,170, Cl. 252-73.000.

Saraf, Lumdas H.: *See—*
Friedman, Jules D.; and Saraf, Lumdas H., 4,233,337, Cl. 427-84.000.

Sarkar, Arnab, to Corning Glass Works. Apparatus and method for making optical filament preform. 4,233,045, Cl. 65-3.00A.

Sarudate, Tutomu: *See—*
Monma, Noboru; Maekawa, Iwao; Sarudate, Tutomu; Sato, Hidetaka; and Uchigasaki, Isao, 4,233,413, Cl. 525-168.000.

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Sasaki, Makoto: *See—*
Tsuchiya, Shozo; Hayashi, Hideo; Sasaki, Makoto; Goto, Kiyoshi; and Ihida, Kazuyoshi, 4,233,420, Cl. 525-310.000.

Sasse, Klaus; Beck, Gunther; Eue, Ludwig; and Schmidt, Robert R., to Bayer Aktiengesellschaft. 4,5-Dichloro-imidazole-1-carboxylic acid aryl esters and their use as plant protection agents. 4,233,058, Cl. 71-92.000.

Sato, Haruhito; Ichikawa, Hiroshi; Hayashi, Hiroshi; and Kurisaki, Konomu, to Idemitsu Kosan Company Limited. Sublimable composition. 4,233,161, Cl. 252-1.000.

Sato, Haruki; and Kawasumi, Yoshio, to Nihon Kogyo Kabushiki Kaisha. Process for granulating metal sulfide powders. 4,233,254, Cl. 264-37.000.

Sato, Hidetaka: *See—*
Monma, Noboru; Maekawa, Iwao; Sarudate, Tutomu; Sato, Hidetaka; and Uchigasaki, Isao, 4,233,413, Cl. 525-168.000.

Sato, Kunihiko; Urata, Tetsuro; Asamoto, Tetsuhiro; Asakawa, Kobun; Uebayashi, Takeo; and Kawano, Mitugi, to Mitsubishi Denki Kabushiki Kaisha; and Nippon Kokan Kabushiki Kaisha. Process for electrical discharge machining of cylindrical work. 4,233,485, Cl. 219-69.00M.

Sato, Masaaki, to Olympus Optical Co., Ltd. Radio tuner for coupling with tape recorder. 4,233,686, Cl. 455-344.000.

Sato, Reisuke, to Pioneer Electronic Corporation. Light receiving circuit having fast response time and a stable output waveform. 4,233,505, Cl. 250-214.00R.

Sato, Seisiro, to Hitachi, Ltd. Scanning electron microscope. 4,233,510, Cl. 250-311.000.

Sato, Yasushi: *See—*
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Kitamura, Takashi; Watanabe, Asao; Nakano, Takashi; Masaki, Katsumi; Hirayama, Kazuhiro; Sato, Yasushi; and Tokiwa, Taisuke, 4,232,954, Cl. 354-7.000.

Sato, Yoshiaki; and Arai, Hajime, to Toray Industries, Inc. Separable composite fiber and process for producing same. 4,233,355, Cl. 428-224.000.

Satoh, Tetsuo: *See—*
Yoshikawa, Kenichi; Koshikawa, Makoto; Umemoto, Toshio; Satoh, Tetsuo; Ichikawa, Singo; and Kato, Yoshiaki, 4,232,512, Cl. 368-82.000.

Satoh, Tsuyoshi, to Mitsubishi Denki Kabushiki Kaisha. Elevator position detector. 4,233,588, Cl. 340-21.000.

Satohara, Norio: *See—*
Tamura, Masamitu; Yasuhara, Yukio; Nakamura, Shigeharu; Sakai, Masaru; Akagi, Kazuo; Kazihata, Ryohei; and Satohara, Norio, 4,233,108, Cl. 156-639.000.

Satterly, Kenneth P.; and Livingston, Frank E., to Witco Chemical Corporation. Polyurethane foams from polyester precursor derived from adipic acid process waste. 4,233,408, Cl. 521-172.000.

Satterwhite, Charles R., to Unit Rig & Equipment Co. Excavating and pipeline installation system. 4,232,982, Cl. 405-179.000.

Sauer, Mark R., to UNL Incorporated. Format assembler for photographic printer. 4,232,962, Cl. 355-46.000.

Sauerteig, Wolfgang: *See—*
Nittel, Fritz; Czernik, Karl; Sauerteig, Wolfgang; Himmelmann, Wolfgang; and Bergthaller, Peter, 4,233,398, Cl. 430-495.000.

Sauerwein, Georges, to AB Broderna Kjellstrom. Optical sighting device. 4,232,965, Cl. 356-144.000.
Savelli, Aulo; Grianti, Francesco; Arcozzi, Giovanni; and Di Bari, Leonardo, to D G T S.r.l. Medical breathing apparatus. 4,232,666, Cl. 128-203.250.
Savin Corporation: *See*—
Lanoa, Benzion, 4,233,381, Cl. 430-33.000.
Sawa, Yuji; and Endo, Sigeru, to Kureha Kagaku Kogyo Kabushiki Kaisha. Apparatus for delivering parisons of preselected length and diameter. 4,233,019, Cl. 425-305.100.
Sawada, Daisaku: *See*—
Yamaguchi, Hiroaki; Hattori, Tadashi; Nishida, Minoru; Goto, Kenji; Sawada, Daisaku; and Shigematu, Takashi, 4,232,642, Cl. 123-416.000.
Sawada, Kazuo, to Sumitomo Electric Industries, Ltd. Soft copper alloy conductors. 4,233,067, Cl. 75-153.000.
Sawamura, Ichiro; and Tsuboshima, Kosaku, to Olympus Optical Co., Ltd. Apparatus for automatic diagnosis of cells. 4,232,970, Cl. 356-432.000.
Schadlich, Gunther: *See*—
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Schaefer, Robert H.: *See*—
Hammel, Richard L.; Schaefer, Robert H.; Lancia, Frederick N.; Wolfe, William A.; Dearth, Leonard F.; Benton, Stephen L.; Homan, H. Richard; and Bruce, Arthur P., 4,232,798, Cl. 221-12.000.
Schaeffer, Anthony J., to Northwestern University. Method of maintaining bacterial sterility in urine drainage bags. 4,233,263, Cl. 422-28.000.
Schafer, Fritz P.; and Stuke, Michael, to Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V. Method of photochemical separation of isotopes. 4,233,125, Cl. 204-157.10R.
Schafer, Jurgen, to Dragerwerk Aktiengesellschaft. Process for the production of carbon dioxide absorption agent pellets for use in respiratory equipment. 4,233,190, Cl. 252-475.000.
Schanbacher, William A. Frequency selective hysteresis comparator. 4,233,563, Cl. 328-138.000.
Schaum-Chemie W. Bauer K.G.: *See*—
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Scheer, Peter; and Hamann, Arnold. Treatment chair with cool-light lamp for dental medicinal purposes. 4,233,649, Cl. 362-32.000.
Scheffel, Norman B.: *See*—
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Scherer, George W.: *See*—
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Schering Aktiengesellschaft: *See*—
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Kruger, Hans-Rudolf; Arndt, Friedrich; Baumert, Dietrich; Joppien, Hartmut; Pieroh, Ernst A.; and Rusch, Reinhart, 4,233,059, Cl. 71-92.000.
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Schirmer, Gunter: *See*—
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Schiweck, Hubert; Steinle, Georg; Muller, Lutz; Gau, Wolfgang; and Munir, Mohammad, to Suddeutsche Zucker-Aktiengesellschaft. Glucopyranosido-1,6-mannitol, a process for producing the same and its use as a sugar substitute. 4,233,439, Cl. 536-4.000.
Schmand, Horst; and Dannenberg, Wolfgang, to Riedel-de Haen Aktiengesellschaft. Process for the manufacture of optically active, optionally substituted 2-amino-2-phenylacetic acid. 4,233,456, Cl. 562-401.000.
Schmid, Carl J., to Peerless Electronics Research Corporation. Peristaltic pump. 4,233,001, Cl. 417-475.000.
Schmidt, Ludwig; and Wellie, Werner, to Ruhrkohle, A.G.; and Schaum-Chemie W. Bauer K.G. Means for the production of a multi-component plastics material. 4,232,974, Cl. 366-162.000.
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Schmidt, Walter, to Siemens Aktiengesellschaft. Power supply for an electric precipitator. 4,233,039, Cl. 55-139.000.
Schmidt, Walter, to Swiss Aluminium Ltd. Process and device for growing crystal. 4,233,270, Cl. 422-249.000.
Schmitt, Joseph L., Jr.: *See*—
Bright, John H.; and Schmitt, Joseph L., Jr., 4,233,458, Cl. 562-458.000.
Schneider, Franz; Braitinger, Helmut; Bergmann, Ewald; and Kurz, Otto, to L. Schuler GmbH. Arrangement for punching out circular blanks. 4,232,575, Cl. 83-71.000.
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Schnelle, Manfred. Furniture hinge. 4,232,423, Cl. 16-130.000.
Scholz, Herbert, to BASF Aktiengesellschaft. Preparation of oxazolidine-2,4-diones. 4,233,450, Cl. 548-226.000.
Schpak, Fred; and Malkes, Ian D., to Laco Laboratories, Inc. Contact lens device. 4,232,966, Cl. 356-244.000.
Schreurs, Jan W. H.: *See*—
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Schroeder, Hobe; and Palmer, David A., to Standard Oil Company (Indiana). Phthalic anhydride formation and separation. 4,233,227, Cl. 260-346.700.
Schroer, Horst; Goliasch, Karl; and Beck, Uwe, to Bayer Aktiengesellschaft. Process for the preparation of 2-oxoiminophenylacetonitrile. 4,233,233, Cl. 260-465.00E.
Schroer, Klaus: *See*—
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Schulman, Joseph H., to Pacesetter Systems, Inc. Programmable human tissue stimulator. 4,232,679, Cl. 128-419.0PG.
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Schwab, Jean-Francois: *See*—
Sudler, Roland; Kupferschmidt, Peter; and Schwab, Jean-Francois, 4,233,680, Cl. 368-76.000.
Schwartz, Charles A. Deep throat resistance welder. 4,233,488, Cl. 219-89.000.
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Kim, Sung C.; and Schwartz, Marvin P., 4,232,735, Cl. 165-183.000.
Schwarz, Hans-Helmut: *See*—
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Schwarzschild, Jack, to Timex Corporation. Adjustable piezoelectric transducer for a watch. 4,233,679, Cl. 368-72.000.
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Scotese, Anthony C.; Morris, Robert L.; and Santilli, Arthur A., to American Home Products Corporation. 5-Chloro-7,8-dihydro-7-oxopyrido[2,3-d]pyrimidine-6-carboxylic acid derivatives. 4,233,446, Cl. 544-279.000.
Scott, Burton W.: *See*—
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Kitzing, Rainer; Scott, John G. V.; Webb, Terence C.; and Evans, Graham, 4,233,399, Cl. 430-510.000.
Scoville, John R.; and Gigandet, Richard W., to Lincoln Manufacturing Company, Inc. Food warming cabinet. 4,233,495, Cl. 219-386.000.
Scragg, Frederick; and Marshman, Peter. Method of lining a pipe. 4,233,101, Cl. 156-287.000.
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Seeger, Ernst: *See*—
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Seiko Koki Kabushiki Kaisha: *See*—
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Selman, Thomas G., to Gestetner Limited. Plate loader for offset printing machines. 4,232,602, Cl. 101-132.000.
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Hascoe, Norman, 4,232,814, Cl. 228-173.00E.
Sen, Soumendra N.: *See*—
Ghosh, Bidhan C.; Chopra, Gopal M.; and Sen, Soumendra N., 4,233,095, Cl. 149-95.000.
Senda, Teruo; and Otani, Mitsunobu, to Toray Industries, Inc. Solid-liquid separation element and apparatus. 4,233,159, Cl. 210-413.000.
Sentry Controls, Inc.: *See*—
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Serrano, Rudy C. Storage and display device for record albums and tapes. 4,232,790, Cl. 211-40.000.

Service Equipment Design Co., Inc.: *See—*
Hauk, Ernest D.; and Kirkpatrick, Jesse C., 4,232,752, Cl. 175-135.000.
Serwatowski, Frank J. Fireplaces of the type having fireboxes constructed of firebrick. 4,232,652, Cl. 126-120.000.
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O'Connor, James M.; and Sessions, Willie J., 4,233,205, Cl. 260-40.0TN.
Seymour, Samuel L., to PPG Industries, Inc. Method and apparatus for shaping glass sheets by drop forming. 4,233,049, Cl. 65-106.000.
SGS-ATES Componenti Elettronici S.p.A.: *See—*
Gambardella, Antonio; and Panigada, Marco, 4,233,133, Cl. 204-181.00N.
Shaffer, Donald J. Engine with additional shared flow control runner for two cylinders. 4,232,639, Cl. 123-52.0MV.
Shaheen, Joseph M., to United States of America, Air Force. High temperature-resistant conductive adhesive and method employing same. 4,233,103, Cl. 156-331.000.
Shalai, Alexandr N.; Nikitin, Mikhail D.; Zakharov, Nikolai I.; and Bratchenko, Anatoly P. Method of reinforcing aluminium alloy piston ring groove. 4,233,490, Cl. 219-121.00P.
Shald, Roland L. Water ski rack. 4,232,806, Cl. 224-42.440.
Shanks, Ian A., to Secretary of State for Defence. Liquid crystal display device. 4,232,948, Cl. 350-347.00R.
Shapiro, Eugene: *See—*
Smith, Warren F., Jr.; Vitek, John M.; and Shapiro, Eugene, 4,233,068, Cl. 75-157.500.
Smith, Warren F., Jr.; Vitek, John M.; and Shapiro, Eugene, 4,233,069, Cl. 75-157.500.
Sharon Manufacturing Company: *See—*
Hudson, Sharon J., Jr.; and Petersen, Karl T., 4,232,796, Cl. 220-89.00B.
Sharp Kabushiki Kaisha: *See—*
Funada, Fumiaki; and Shimizu, Keiichiro, 4,232,947, Cl. 350-341.000.
Nagasaka, Takakazu; and Nakamura, Yasuhide, 4,232,689, Cl. 133-4.00A.
Shea, James M.; Tobin, Michael F.; and Anderson, Stanley E., to General Motors Corporation. Power steering gear with flow check valve. 4,232,585, Cl. 91-432.000.
Shelcore, Inc.: *See—*
Lin, Charles C. C., 4,232,477, Cl. 46-88.000.
Shelef, Mordecai: *See—*
Gandhi, Haren S.; and Shelef, Mordecai, 4,233,188, Cl. 252-470.000.
Gandhi, Haren S.; Kummer, Joseph T.; Shelef, Mordecai; Stepien, Henryk K.; and Yao, Hsien C., 4,233,189, Cl. 252-472.000.
Shelffo, Loren E., to Eskofot Research A/S. Toner applicator for electrostatic copier. 4,232,628, Cl. 118-653.000.
Shell Oil Company: *See—*
Richardson, Edwin A.; Scheuerman, Ronald F.; Berkshire, David C.; Reisberg, Joseph; and Lybarger, James H., 4,232,741, Cl. 166-281.000.
Willis, Carl L.; and Slaugh, Lynn H., 4,233,460, Cl. 562-537.000.
Shelly, Newton L., Jr. Hand held liquid spray head with removable liquid conduit. 4,232,828, Cl. 239-329.000.
Shemitz, Norman S., to Shemsafe Incorporated. Assemblable lamp shade and structures. 4,233,656, Cl. 362-352.000.
Shemsafe Incorporated: *See—*
Shemitz, Norman S., 4,233,656, Cl. 362-352.000.
Shenian, Popkin R.: *See—*
Abolins, Visvaldis; Holub, Fred F.; and Shenian, Popkin R., 4,233,199, Cl. 260-30.60R.
Sheppard, John P.: *See—*
Taylor, Rodney; Pragnell, Robert J.; and Sheppard, John P., 4,233,357, Cl. 428-245.000.
Sheppard, Robert S., to PPG Industries, Inc. Preparing refractory metal boride powder. 4,233,277, Cl. 423-297.000.
Sher, Geoffrey: *See—*
Eifler, Raymond J.; Datwyler, Walter F., Jr.; Statland, Bernard E.; and Sher, Geoffrey, 4,233,033, Cl. 23-232.00E.
Statland, Bernard E.; and Sher, Geoffrey, 4,233,032, Cl. 23-230.00B.
Sheridan, Geoffrey P., to Lankro Chemicals Limited. Quick-break cleaning compositions. 4,233,174, Cl. 252-170.000.
Sheridan, Ronald D.: *See—*
Kline, Mark H.; Liebel, John T., Jr.; and Sheridan, Ronald D., 4,232,924, Cl. 339-17.00L.
Sherwood Tool, Incorporated: *See—*
Johnson, Warren E., 4,232,590, Cl. 493-10.000.
Shetty, Bola V., to Pennwalt Corporation. Substituted 1,2,4,5-tetrahydro-3H, 3 benzazepines. 4,233,217, Cl. 260-239.0BB.
Shiba, Keisuke; and Kita, Nobuyuki, to Fuji Photo Film Co., Ltd. Silver halidephotosensitive material. 4,233,393, Cl. 430-265.000.
Shibata, Akira, to Chugai Denki Kogyo Kabushiki-Kaisha. Apparatus for making a tri-metallic composite electrical contact. 4,232,812, Cl. 228-3.100.
Shibata, Hiroshi, to VLSI Technology Research Association. Masking technique usable in manufacturing semiconductor devices. 4,232,439, Cl. 29-579.000.
Shibata, Kouhei: *See—*
Ikeda, Satoshi; and Shibata, Kouhei, 4,232,782, Cl. 198-706.000.
Shibata, Yasuo: *See—*
Nakano, Keita; and Shibata, Yasuo, 4,233,611, Cl. 346-155.000.
Shiber, Samuel. Variable geometry whirler. 4,232,645, Cl. 123-590.000.
Shields, Dean W., to Kockums Industries, Inc. Crane. 4,232,792, Cl. 212-160.000.
Shiflet, Frank L., to Hopeman Brothers, Inc. Formaminous sheet. 4,233,350, Cl. 428-110.000.
Shigehisa, Fukuda: *See—*
Yoshio, Komaki; Shigehisa, Fukuda; Tsuguhiro, Fukuda; Noriaki, Nakao; Katsuhide, Suzuki; and Matsuo, Ishizuka, 4,232,895, Cl. 296-65.00A.
Shigematu, Takashi: *See—*
Yamaguchi, Hiroaki; Hattori, Tadashi; Nishida, Minoru; Goto, Kenji; Sawada, Daisaku; and Shigematu, Takashi, 4,232,642, Cl. 123-416.000.
Shimano Industrial Company, Limited: *See—*
Noda, Hideo, 4,232,842, Cl. 242-212.000.
Shimizo, Hidehiro: *See—*
Moriki, Yasumitsu; Takahashi, Izumi; Sakurai, Masahiro; and Shimizo, Hidehiro, 4,233,487, Cl. 219-76.110.
Shimizu, Keiichiro: *See—*
Funada, Fumiaki; and Shimizu, Keiichiro, 4,232,947, Cl. 350-341.000.
Shimogawa, Toshiaki: *See—*
Tsuge, Noboru; Kuwakado, Satosi; Takei, Toshihiro; and Shimogawa, Toshiaki, 4,232,886, Cl. 280-806.000.
Shimomura, Hiromi; Sugie, Akihiko; and Katsube, Junki, to Sumitomo Chemical Company, Limited. Cyclopentylacetic acid derivatives. 4,233,222, Cl. 260-343.30P.
Shin-Etsu Chemical Co., Ltd.: *See—*
Asai, Michihiko; Suda, Yoshio; Imada, Kiyoshi; Ueno, Susumu; and Nomura, Hirokazu, 4,233,419, Cl. 525-288.000.
Shin Meiwa Industry Co., Ltd.: *See—*
Maruyama, Shigeo; Nishikaichi, Yuji; Fujinaga, Shigeki; and Miura, Tatsuya, 4,233,491, Cl. 219-125.100.
Shinchi, Yoshikazu: *See—*
Koseki, Wasuke; Mori, Kunihito; Obata, Hideo; and Shinchi, Yoshikazu, 4,232,536, Cl. 68-12.00R.
Shinko Kiko Co., Ltd.: *See—*
Ikeda, Satoshi; and Shibata, Kouhei, 4,232,782, Cl. 198-706.000.
Shinoki, Hisazi: *See—*
Sugimoto, Shun-ichiro; and Shinoki, Hisazi, 4,233,585, Cl. 335-262.000.
Shinopulos, George: *See—*
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Shinpo Kogyo Kabushiki Kaisha: *See—*
Kashihara, Manabu; Okamura, Kikuo; Muguruma, Yoshikata; Yamano, Shizuo; and Mizusawa, Shigeo, 4,232,561, Cl. 74-191.000.
Shionogi & Co., Ltd.: *See—*
Uyeo, Shoichiro; Yoshioka, Mitsuru; Tsuji, Teruji; Kikkawa, Ikuo; and Nagata, Wataru, 4,233,216, Cl. 260-239.00A.
Shipek, Edward J.: *See—*
Bierlein, John C.; and Shipek, Edward J., 4,233,071, Cl. 75-231.000.
Shishulin, Jury P.: *See—*
Antipov, Georgy A.; Gelfand, Mikhail L.; Goldshtein, Boris G.; Rutgaizer, Mikhail I.; Suut, Nikolai K.; Tsipenjuk, Yakov I.; Shishulin, Jury P.; Galimov, Apas G.; Sutyagin, Oleg Y.; and Yankovsky, Oleg A., 4,232,750, Cl. 173-93.600.
Shiverdecker, Howard P. Fish lure. 4,232,469, Cl. 43-42.270.
Showa Denko Kabushiki Kaisha: *See—*
Nagato, Nobuyuki; and Sugiyama, Yuichi, 4,233,242, Cl. 564-249.000.
Showa Yuka Kabushiki Kaisha: *See—*
Okamoto, Hiroo; and Nakauchi, Shunsaku, 4,233,596, Cl. 340-578.000.
Sibilia, John P.: *See—*
Aharoni, Shaul M.; Sibilia, John P.; and Kozlowski, Deborah R., 4,232,951, Cl. 350-350.00R.
Sicre, Jean-Luc; and Gruaz, Daniel, to Societe Francaise d'Equipements pour la Navigation Aerienne (S.F.E.N.A.). Method and system for controlling the decelerated approach of an aerodyne. 4,232,839, Cl. 244-188.000.
Siddall, Richard J., to Huntington Alloys Inc. Atomization into a chamber held at reduced pressure. 4,233,062, Cl. 75-0.50C.
Sie, Swan A.: *See—*
Brown, Earl J.; and Sie, Swan A., 4,233,677, Cl. 367-13.000.
Siemens Aktiengesellschaft: *See—*
Knauer, Karl; and Pfleiderer, Hans-Jorg, 4,233,578, Cl. 333-165.000.
Koch, Rudolf; and Pfleiderer, Hans-Joerg, 4,233,527, Cl. 307-311.000.
Schmidt, Walter, 4,233,039, Cl. 55-139.000.
Trepte, Wulf, 4,233,516, Cl. 250-444.000.
Zobawa, Franz, 4,232,929, Cl. 339-143.00R.
SIG Schweizerische Industrie-Gesellschaft: *See—*
Thoma, Hans, 4,232,748, Cl. 173-3.000.
Signetics Corporation: *See—*
Russell, Lewis K.; and Kleitman, David, 4,233,674, Cl. 365-200.000.
Silvestrova, Iraida M.: *See—*
Barta, Cestmir; Ctyroky, Jiri; Silvestrova, Iraida M.; and Pisarevskij, Jurij V., 4,232,952, Cl. 350-358.000.
Silvia, John P.: *See—*
Willwerth, Charles M.; and Silvia, John P., 4,233,012, Cl. 425-162.000.
Simic, Milutin, to Chevron Research Company. Plasticized sulfur coating composition. 4,233,082, Cl. 106-287.230.
Simmons Fastener Corporation: *See—*
Hoen, Cuyler, 4,232,890, Cl. 292-114.000.

Simon-Lavoine, Nicole; and Forgeot, Marcel, to Science Union et Cie. Novel biological substance from a fungus and the process for producing the same. 4,233,291, Cl. 424-177.000.

Simons, Robert E.: *See—*
Hwang, Un-Pah; and Simons, Robert E., 4,233,644, Cl. 361-384.000.

Singer Company, The: *See—*
Garron, Stephen A., 4,232,617, Cl. 112-158.00B.
Ketterer, Stanley J., 4,232,618, Cl. 112-184.000.

Sion, Marcel-Xavier: *See—*
Bourguignon, Jean; Sion, Marcel-Xavier; and Moreau, Michel, 4,233,245, Cl. 564-506.000.

Sitter, Elmer J.: *See—*
Corvington, Edward J.; and Sitter, Elmer J., 4,232,489, Cl. 52-63.000.

Skipton, Robert W.: *See—*
Miller, Donald; and Skipton, Robert W., 4,232,417, Cl. 9-8.00R.

Skovajsa, Joseph. Device for the local treatment of a patient, and more particularly applicable in acupuncture and auriculotheraphy. 4,232,678, Cl. 128-395.000.

Slangan, Gary; and Tsunashima, Masaaki, to International Flavors & Fragrances Inc. Ice cream package including compartment for heating syrup. 4,233,325, Cl. 426-107.000.

Slaugh, Lynn H.: *See—*
Willis, Carl L.; and Slaugh, Lynn H., 4,233,460, Cl. 562-537.000.

Smith, Albert J.: *See—*
Craddock, Peter J.; Law, Brian R.; and Smith, Albert J., 4,232,579, Cl. 83-788.000.

Smith, Dennis M.: *See—*
Lewis, William R.; and Smith, Dennis M., 4,232,804, Cl. 222-591.000.

Smith, Donald L.: *See—*
Clark, Michael N.; and Smith, Donald L., 4,232,843, Cl. 244-3.290.

Smith, Douglas D.: *See—*
Cunningham, Richard N.; Smith, Douglas D.; and Loeffler, Romain E., deceased, 4,233,100, Cl. 156-260.000.

Smith, Edward F., Sr.; and Treesh, Lloyd N. Feeder device. 4,232,631, Cl. 119-52.0AF.

Smith, Eugene L., Jr.: *See—*
Wang, Samuel S.; and Smith, Eugene L., Jr., 4,233,150, Cl. 209-166.000.

Smith International, Inc.: *See—*
Trzeciak, Kurt H., 4,232,751, Cl. 175-101.000.

Smith, Jimmie L.; Honeycutt, John D.; and Dobie, Michael J., to Stewart Engineering & Equipment Company. Pan inverting apparatus and method. 4,232,777, Cl. 198-404.000.

Smith, Oliver W.: *See—*
Borden, George W.; Smith, Oliver W.; and Trecker, David J., 4,233,130, Cl. 204-159.230.

Smith, Wallace B.: *See—*
Pontius, Duane H.; and Smith, Wallace B., 4,233,037, Cl. 55-2.000.

Smith, Warren F., Jr.; Vitek, John M.; and Shapiro, Eugene. Modified brass alloys with improved stress relaxation resistance. 4,233,068, Cl. 75-157.500.

Smith, Warren F., Jr.; Vitek, John M.; and Shapiro, Eugene, to Olin Corporation. Modified brass alloys with improved stress relaxation resistance. 4,233,069, Cl. 75-157.500.

Smithson, Terence: *See—*
Allen, Edward A.; Phillips, Peter C.; and Smithson, Terence, 4,233,035, Cl. 44-73.000.

Snamprogetti, S.p.A.: *See—*
Antonelli, Sergio; and Borza, Michele, 4,233,140, Cl. 208-180.000.

Snyder, Charles M.: *See—*
Welling, Conrad G.; Davenport, Gordon H.; Reichert, Guenter; Snyder, Charles M.; Harrold, Milton C.; Donze, Salvatore H.; and Larsen, Frank R., 4,232,903, Cl. 299-8.000.

Snyder, Robert: *See—*
Suvak, Fahrettin; and Snyder, Robert, 4,232,603, Cl. 101-148.000.

Snyder, Robert C., to Motor Wheel Corporation. Systems and methods for controlling trailer brakes as a function of trailer wheel rotation. 4,232,910, Cl. 303-96.000.

Sobey, Arnold J., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Aerofoil with composite tip section having skewed fibres. 4,232,844, Cl. 244-123.000.

Societa Italiana Telecomunicazioni Siemens S.p.A.: *See—*
Lupatin, Elio; and Rizzi, Luigi, 4,233,658, Cl. 363-26.000.
Raveglia, Dalmazio; Lonati, Carlo; and Macchi, Giancarlo, 4,233,577, Cl. 333-136.000.

Societe Anonyme Francaise du Ferodo: *See—*
Dauvergne, Jean L. R., 4,232,519, Cl. 60-550.000.

Societe Chimique de La Grande Paroisse, Azote et Produits Chimiques: *See—*
Bourguignon, Jean; Sion, Marcel-Xavier; and Moreau, Michel, 4,233,245, Cl. 564-506.000.

Societe Civile Hydromer: *See—*
Le Jeune, Gwenole, 4,232,600, Cl. 100-37.000.

Societe d'Applications Generales d'Electricite et de Mechanique (SAGEM): *See—*
Berger, Henri, 4,233,550, Cl. 318-568.000.

Societe d'Etudes de Machines Thermiques S.E.M.T.: *See—*
Curtil, Remi, 4,232,641, Cl. 123-76.000.

Societe Francaise d'Equipements pour la Navigation Aerienne (S.F.E.N.A.): *See—*
Sicre, Jean-Luc; and Gruaz, Daniel, 4,232,839, Cl. 244-188.000.

Societe Nationale des Poudres et Explosifs: *See—*
Pascal, Helene M.; and Emeury, Jean-Marie L., 4,233,463, Cl. 568-584.000.

Societe Nationale Elf-Aquitaine (Production): *See—*
Ollivier, Jean; Souloumiac, Guy; and Suberlucq, Jeannine, 4,233,128, Cl. 204-158.00R.

Societe Symac: *See—*
Ligouzat, Pierre, 4,232,973, Cl. 366-157.000.

Sokolov, Viktor E.: *See—*
Grachev, Konstantin A.; Berber, Viktor A.; Sokolov, Viktor E.; Pavlov, Vladimir V.; Popov, Alexei N.; and Zolotenko, Vladimir A., 4,232,967, Cl. 356-336.000.

Solartron Electronic Group Limited: *See—*
Stansfeld, James W., 4,232,544, Cl. 73-32.00A.

Soloway, Norman P.: *See—*
Owades, Joseph L., 4,233,334, Cl. 426-590.000.

Solvay & Cie.: *See—*
Giacopelli, Umberto; Grassi, Bruno; and Crabbe, Rene, 4,233,147, Cl. 204-266.000.
Plumet, Lucien, 4,233,081, Cl. 106-214.000.

Sontag, Klaus A. Package for individually wrapped strip-shaped pieces of chewable and edible articles. 4,233,326, Cl. 426-115.000.

Sony Corporation: *See—*
Kubota, Yukio, 4,233,637, Cl. 360-10.000.
Sugawara, Kokichi, 4,232,840, Cl. 242-198.000.
Suzuki, Masao, 4,233,635, Cl. 358-243.000.
Yamagiwa, Kazuo; and Numakura, Toshihiko, 4,233,621, Cl. 358-8.000.

Soothill, John F.; and Levinsky, Roland J., to National Research Development Corporation. Low affinity IGM-latex particles and assay therewith for immune complexes. 4,233,286, Cl. 424-12.000.

Sorenby, Lars M.: *See—*
Bergstrand, Sten H. A. M.; Kjellin, Per G.; Persson, Carl G. A.; and Sorenby, Lars M., 4,233,303, Cl. 424-253.000.

Sosnowski, Stanislaw J. A.: *See—*
Potter, James C.; and Sosnowski, Stanislaw J. A., 4,232,644, Cl. 123-450.000.

Souloumiac, Guy: *See—*
Ollivier, Jean; Souloumiac, Guy; and Suberlucq, Jeannine, 4,233,128, Cl. 204-158.00R.

South African Coal, Oil & Gas Corp., Limited: *See—*
Ingram, Jocely P.; Kassat, Harry; and Kolenda, Herbert, 4,232,729, Cl. 165-39.000.

SPA-Societa Prodotti Antibiotici, S.p.A.: *See—*
Ferrari, Lorenzo; Dell'Acqua, Ernani; and Quaglia, Giorgio, 4,233,290, Cl. 424-94.000.

Spaziani, Frederick F.; and Fowler, James E., to Nova Biomedical Corporation. Liquid membrane electrode. 4,233,136, Cl. 204-195.00L.

Spees, Arthur T., to Visu-Flex Corporation. Panel file. 4,232,463, Cl. 40-373.000.

Sperry Corporation: *See—*
Liebergot, Harris L.; and Sedmak, Richard M., 4,233,682, Cl. 371-68.000.

Sperry Rand Corporation: *See—*
Walberg, Per-Erik; Johann, Donald F.; and Mendenhall, Charles E., 4,233,666, Cl. 364-900.000.

Speyer, Henning J., to Sears, Roebuck and Co. Combination bed and lounge assembly. 4,232,411, Cl. 5-8.000.

Spinner, Georg: *See—*
Treczka, Leo; and Spinner, Georg, 4,233,580, Cl. 333-261.000.

Spinner GmbH: *See—*
Treczka, Leo; and Spinner, Georg, 4,233,580, Cl. 333-261.000.

Spivack, John D., to Ciba-Geigy Corporation. Hydrolytically stable ortho-alkylated phenyl phosphonites and stabilized compositions. 4,233,207, Cl. 260-45.70P.

Spivack, John D., to Ciba-Geigy Corporation. Polymer compositions stabilized with hindered phenyl secondary phosphites. 4,233,208, Cl. 260-45.8NT.

Sprague Electric Company: *See—*
Genesi, Robert C., 4,233,618, Cl. 357-35.000.

Sprengel, Heide: *See—*
Klupfel, Kurt; and Sprengel, Heide, 4,233,395, Cl. 430-271.000.

Springer, Donald A., to Anchor Hocking Corporation. Food serving tray for use in a food preparation unit. 4,232,789, Cl. 206-562.000.

Springer, William E., to Clairol Incorporated. Variable airflow hair treatment device. 4,232,454, Cl. 34-97.000.

Springett, Charles: *See—*
Goren, Yoram; and Springett, Charles, 4,232,625, Cl. 114-264.000.

Spurr, Robert, to Emhart Industries, Inc. Plastic bottle forming machine. 4,233,021, Cl. 425-525.000.

Squires, David T., to Raychem Limited. Heat-recoverable articles. 4,232,712, Cl. 138-109.000.

Sramek, John A., to S. C. Johnson & Son, Inc. Liquid detergent softening and brightening composition. 4,233,167, Cl. 252-8.750.

Stackhouse, William H., to Lantech Inc. Economy automatic wrapping apparatus. 4,232,501, Cl. 53-399.000.

Stafford, David A.: *See—*
Hawkes, Dennis L.; Horton, Rex; and Stafford, David A., 4,233,155, Cl. 210-92.000.

Stahl, Eugen H., to Hans Grohe GmbH & Co. KG. Method of making a flexible plastic tube. 4,233,097, Cl. 156-143.000.

Stahl, John M.; and DeRoss, Robert W., to Bunker Ramo Corporation. Circuit transfer apparatus. 4,233,478, Cl. 200-51.090.

Stalker, Kenneth W.; Zelahy, John W.; and Fairbanks, Norman P., to General Electric Company. Gas seal for turbine blade tip. 4,232,995, Cl. 415-172.00A.

Stanberry, Daniel C.: *See*—
Zenner, Sylvester F.; and Stanberry, Daniel C., 4,233,321, Cl. 426-19.000.
Zenner, Sylvester F.; and Stanberry, Daniel C., 4,233,330, Cl. 426-321.000.
Standard Oil Company (Indiana): *See*—
D'Souza, Gerard J.; and Radford, Herschel D., 4,233,276, Cl. 423-230.000.
Hoff, Glen R.; and Fotis, Peter, 4,233,182, Cl. 252-429.00C.
Hoff, Glen R.; and Fotis, Peter, 4,233,253, Cl. 260-987.000.
Schroeder, Hobe; and Palmer, David A., 4,233,227, Cl. 260-346.700.
Standard Telephones and Cables Limited: *See*—
Butcher, John A. W.; and Salino, Michael A., 4,233,471, Cl. 178-69.00G.
Stanford University: *See*—
Gerzberg, Levy; Gat, Arnon; Melen, Roger; and Gibbons, James F., 4,233,671, Cl. 365-105.000.
Stansel, F. Harrison: *See*—
Pfenninger, Billy J.; and Stansel, F. Harrison, 4,232,747, Cl. 172-311.000.
Stansfeld, James W., to Solartron Electronic Group Limited. Transducer for sensing a parameter of a fluid. 4,232,544, Cl. 73-32.00A.
Stark, Friedrich: *See*—
Aichert, Hans; Dietrich, Walter; Hoffmann, Otto-Horst; Stark, Friedrich; and Stephan, Herbert, 4,233,342, Cl. 427-251.000.
Starr, Hank: *See*—
Bauch, Tamil D.; and Starr, Hank, 4,232,494, Cl. 52-221.000.
Statland, Bernard E.; and Sher, Geoffrey, to University of North Carolina at Chapel Hill. Fetal lung maturity test. 4,233,032, Cl. 23-230.00B.
Statland, Bernard E.: *See*—
Eifler, Raymond J.; Datwyler, Walter F., Jr.; Statland, Bernard E.; and Sher, Geoffrey, 4,233,033, Cl. 23-232.00E.
Stauffer Chemical Company: *See*—
Fancher, Llewellyn W.; and Baker, Don R., 4,233,318, Cl. 424-326.000.
McDonald, Harold, 4,233,163, Cl. 252-8.600.
Stearns, George W., to Wagner Electric Corporation. Combination push-pull valve assembly. 4,232,908, Cl. 303-9.000.
Steel Heddle Manufacturing Company: *See*—
Kaufmann, Frank H.; and Kramer, Charles F., 4,232,713, Cl. 139-91.000.
Steer, Peter L.; and Edwards, John V., to Kingsdown Medical Consultants Limited. Ostomy coupling including a venting valve. 4,232,672, Cl. 128-283.000.
Steffick, Joe A., Jr. Fish hook. 4,232,470, Cl. 43-43.160.
Steiger, Anton, to Sulzer Brothers Limited. Method and apparatus for utilizing waste heat from a flowing heat vehicle medium. 4,232,522, Cl. 60-618.000.
Steinberg, David H.: *See*—
Dexter, Martin; and Steinberg, David H., 4,233,209, Cl. 260-45.85E.
Steinle, Georg: *See*—
Schiweck, Hubert; Steinle, Georg; Muller, Lutz; Gau, Wolfgang; and Munir, Mohammad, 4,233,439, Cl. 536-4.000.
Steketee, Cornelis J., to Vandenende B.V. Device for digging up tuberous plants, for example, beets. 4,232,743, Cl. 171-55.000.
Stellinger, Thomas S.; and Crosby, Stephen R., to Wallace Murray Corporation. Saw blade and method of making. 4,232,578, Cl. 83-661.000.
Stenfors, Alan L.: *See*—
Kaplow, Roy; Butz, David E.; and Stenfors, Alan L., 4,233,586, Cl. 335-303.000.
Stephan, Herbert: *See*—
Aichert, Hans; Dietrich, Walter; Hoffmann, Otto-Horst; Stark, Friedrich; and Stephan, Herbert, 4,233,342, Cl. 427-251.000.
Dietrich, Walter; and Stephan, Herbert, 4,233,515, Cl. 250-397.000.
Stephenson, Robert L., to Allied Chemical Corporation. Motorized passive seat belt system. 4,232,882, Cl. 280-804.000.
Stepien, Henryk K.: *See*—
Gandhi, Haren S.; Kummer, Joseph T.; Shelef, Mordecai; Stepien, Henryk K.; and Yao, Hsien C., 4,233,189, Cl. 252-472.000.
Steppe, Theodore W. Conduit bushing. 4,233,469, Cl. 174-83.000.
Sterck, Lothar: *See*—
Maude, John H.; Sterck, Lothar; and Vilshofer, Alfred, 4,233,264, Cl. 422-117.000.
Sterling Drug Inc.: *See*—
Clarke, Robert L.; and Daum, Sol J., 4,233,448, Cl. 546-125.000.
Clarke, Robert L. G.; and Daum, Sol J., 4,233,449, Cl. 546-125.000.
Stevens, Robert W.: *See*—
Dickerson, Carroll D.; and Stevens, Robert W., 4,232,880, Cl. 280-661.000.
Stewart Engineering & Equipment Company: *See*—
Smith, Jimmie L.; Honeycutt, John D.; and Dobie, Michael J., 4,232,777, Cl. 198-404.000.
Stewart, John S. Circular saw blade. 4,232,580, Cl. 83-835.000.
Stewart, Nelson C. Portable stand for use in loading a muzzle loading rifle. 4,232,919, Cl. 312-254.000.
Stewart, Robert. Sign support stake. 4,232,467, Cl. 40-607.000.
Stiles, James A. R.: *See*—
Haering, Rudolph R.; and Stiles, James A. R., 4,233,377, Cl. 429-218.000.
Still, Michael: *See*—
Rohner, Peter; and Still, Michael, 4,232,935, Cl. 350-96.230.
Stoddard, Ione. Illuminated display stand. 4,232,465, Cl. 40-546.000.
Stoffer, Lewis J., to United States of America, Air Force. Light weight fan assembly. 4,232,996, Cl. 416-191.000.
Stolowitz, Mark: *See*—
Cook, Sidney F.; and Stolowitz, Mark, 4,232,983, Cl. 405-210.000.
Stolowitz, Mark L.: *See*—
Cook, Sidney F.; and Stolowitz, Mark, 4,232,983, Cl. 405-210.000.
Stone, Alan J.: *See*—
Tertinek, Christian T.; and Stone, Alan J., 4,232,980, Cl. 404-112.000.
Stone Construction Equipment, Inc.: *See*—
Tertinek, Christian T.; and Stone, Alan J., 4,232,980, Cl. 404-112.000.
Stroiwas, Edward: *See*—
Lamson, Junior J.; Hall, Richard H.; Stroiwas, Edward; and Yats, Larry D., 4,233,467, Cl. 585-437.000.
Strother, John A., to RCA Corporation. Interference suppression for imaging optical systems. 4,233,501, Cl. 250-203.00R.
Strupat, John P. Gas ventilating device. 4,232,668, Cl. 128-204.240.
Stryjewski, Walter A.: *See*—
Ateya, Antoun I.; and Stryjewski, Walter A., 4,232,959, Cl. 355-3.0FU.
Studer, Henry E., to University of California, The Regents of the. Method and apparatus for recovering tomatoes from severed vines, employing a rotated and oscillated shaker. 4,232,506, Cl. 56-327.00R.
Stuke, Michael: *See*—
Schafer, Fritz P.; and Stuke, Michael, 4,233,125, Cl. 204-157.10R.
Stull, John R., to Du Pont de Nemours, E. I., and Company. Electrical connector. 4,232,927, Cl. 339-99.00R.
Stultz, James C.; and Pecoraro, George A., to PPG Industries, Inc. In situ repair of delaminated float bath bottom refractory. 4,233,047, Cl. 65-27.000.
Stump, Paul E., to Babcock & Wilcox Company, The. Drawing technique. 4,232,541, Cl. 72-283.000.
Sturman, Oded E.; and Grill, Benjamin, to Hydronic Systems, Inc. Controller for fluid flow systems. 4,232,707, Cl. 137-624.200.
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Corrigan, Ara L.; Styck, Wayne G.; and Walden, Gerald M., 4,232,754, Cl. 180-9.500.
Suberlucq, Jeannine: *See*—
Ollivier, Jean; Souloumiac, Guy; and Suberlucq, Jeannine, 4,233,128, Cl. 204-158.00R.
Sublett, Bobby J., to Eastman Kodak Company. Polyester and polyesteramide compositions. 4,233,196, Cl. 260-29.20N.
Suda, Yoshio: *See*—
Asai, Michihiko; Suda, Yoshio; Imada, Kiyoshi; Ueno, Susumu; and Nomura, Hirokazu, 4,233,419, Cl. 525-288.000.
Suddeutsche Zucker-Aktiengesellschaft: *See*—
Schiweck, Hubert; Steinle, Georg; Muller, Lutz; Gau, Wolfgang; and Munir, Mohammad, 4,233,439, Cl. 536-4.000.
Sudler, Roland; Kupferschmidt, Peter; and Schwab, Jean-Francois, to VDO Adolf Schindling AG. Electric clock. 4,233,680, Cl. 368-76.000.
Suga, Shigeru. Integrating sphere type standard light source device. 4,232,971, Cl. 356-446.000.
Sugawara, Kazuo; Sanada, Sei; and Kobayashi, Yosiharu, to Toppan Printing Co., Ltd. Apparatus for estimating a necessary amount of ink. 4,233,663, Cl. 364-515.000.
Sugawara, Kokichi, to Sony Corporation. Tape cassette. 4,232,840, Cl. 242-198.000.
Sugibuchi, Kiyoshi: *See*—
Kurogi, Yukinori; and Sugibuchi, Kiyoshi, 4,233,526, Cl. 307-238.000.
Sugie, Akihiko: *See*—
Shimomura, Hiromi; Sugie, Akihiko; and Katsube, Junki, 4,233,222, Cl. 260-343.30P.
Sugihara, Yasumasa, to General Corporation, The. Signal multiplexing system. 4,233,627, Cl. 358-143.000.
Sugimoto, Shun-ichiro; and Shinoki, Hisazi, to Hitachi, Ltd. Plunger type electromagnet. 4,233,585, Cl. 335-262.000.
Sugiyama, Keiichi: *See*—
Matsumoto, Hiromitsu; and Sugiyama, Keiichi, 4,232,640, Cl. 123-308.000.
Sugiyama, Yuichi: *See*—
Nagato, Nobuyuki; and Sugiyama, Yuichi, 4,233,242, Cl. 564-249.000.
Suladze, Otari N.: *See*—
Barbakadze, Dzhondo F.; Mindeli, Mamuka S.; Macharashvili, Petr G.; Rusidze, Vazha V.; and Suladze, Otari N., 4,232,854, Cl. 266-266.000.
Suling, Carlhans; Balle, Gerhard; Walkowiak, Michael; and Schulz, Hans-Hermann, to Bayer Aktiengesellschaft. Process for the production of bead polymers. 4,233,424, Cl. 525-440.000.
Sultan, S. Bertil: *See*—
Fischbeck, Kenneth H.; Larsson, Stig-Goran; and Sultan, S. Bertil, 4,233,610, Cl. 346-140.00R.
Sulzer Brothers Limited: *See*—
Steiger, Anton, 4,232,522, Cl. 60-618.000.
Sumitomo Chemical Company, Limited: *See*—
Kawabata, Toshio; and Ishiyama, Toshio, 4,233,461, Cl. 562-554.000.
Ono, Keiichi; Sasajima, Kikuo; Katsube, Junki; and Yamamoto, Hisao, 4,233,307, Cl. 424-267.000.
Shimomura, Hiromi; Sugie, Akihiko; and Katsube, Junki, 4,233,222, Cl. 260-343.30P.
Sumitomo Electric Industries, Ltd.: *See*—
Sawada, Kazuo, 4,233,067, Cl. 75-153.000.
Yamamoto, Masachika, 4,232,764, Cl. 188-73.600.

Sumiyoshi, Masaharu; and Motosugi, Katsuhiko, to Toyota Jidosha Kogyo Kabushiki Kaisha. Exhaust gas control actuator. 4,232,517, Cl. 60-276.000.

Sun Oil Company (Delaware): *See*—
Caldwell, Walter C., 4,232,535, Cl. 64-28.00M.

Sundin, Anders O.; and Bronnvall, Wolfgang A., to Aktiebolaget Elektrokoppar. Electrical conductor of aluminium. 4,233,066, Cl. 75-142.000.

Sundstrand Corporation: *See*—
Ross, William A.; and Pollman, Frederic W., 4,232,572, Cl. 74-859.000.

Surget, Jean: *See*—
Favre, Jean-Paul; Perrin, Joseph; Philbert, Michel; and Surget, Jean, 4,232,559, Cl. 73-827.000.

Sussman, Milton H.: *See*—
Swaminathan, Krishnaiyer; and Sussman, Milton H., 4,232,937, Cl. 350-91.000.

Sutera, Richard: *See*—
Nodov, Eugene; Scott, Burton W.; Denlinger, George W.; and Sutera, Richard, 4,232,964, Cl. 355-70.000.

Sutt, Iokhannes I. Metering device. 4,232,700, Cl. 137-93.000.

Sutyagin, Oleg Y.: *See*—
Antipov, Georgy A.; Gelfand, Mikhail L.; Goldshtein, Boris G.; Rutgaizer, Mikhail I.; Suut, Nikolai K.; Tsipenjuk, Yakov I.; Shishulin, Jury P.; Galimov, Apas G.; Sutyagin, Oleg Y.; and Yankovsky, Oleg A., 4,232,750, Cl. 173-93.600.

Suut, Nikolai K.: *See*—
Antipov, Georgy A.; Gelfand, Mikhail L.; Goldshtein, Boris G.; Rutgaizer, Mikhail I.; Suut, Nikolai K.; Tsipenjuk, Yakov I.; Shishulin, Jury P.; Galimov, Apas G.; Sutyagin, Oleg Y.; and Yankovsky, Oleg A., 4,232,750, Cl. 173-93.600.

Suvak, Fahrettin; and Snyder, Robert, to Wood Industries, Inc. Dampening device for offset printing machine. 4,232,603, Cl. 101-148.000.

Suzuki, Ichiro; Motonami, Masanao; and Ogawa, Hisashi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Passive seatbelt system. 4,232,885, Cl. 280-804.000.

Suzuki, Masao, to Sony Corporation. High voltage limiting circuit for a television receiver. 4,233,635, Cl. 358-243.000.

Suzuki, Mitsuyuki; and Ohmi, Atsushi, to Aisin Seiki Kabushiki Kaisha. Sealed type fluid reservoir. 4,232,518, Cl. 60-535.000.

Suzuki, Sadao, to Yoshino Kogyosho Co. Ltd. Orientation-blow molding equipment. 4,233,010, Cl. 425-143.000.

Suzuki, Yasoji; Ochii, Kiyofumi; and Asahi, Hirozi, to Tokyo Shibaura Denki Kabushiki Kaisha. High-speed semiconductor device. 4,233,672, Cl. 365-181.000.

Suzuki, Zituo: *See*—
Okumura, Kazunari; Yamamoto, Shinichi; and Suzuki, Zituo, 4,233,351, Cl. 428-116.000.

Svensk Lasthantering, Bengt Lindahl AB: *See*—
Lindahl, Bengt E., 4,232,619, Cl. 112-417.000.

Swaminathan, Krishnaiyer; and Sussman, Milton H., to American Optical Corporation. Bright field-dark field illumination system. 4,232,937, Cl. 350-91.000.

Sway, Boris; and Reiman, Walter C. Method for tenderizing and/or pasteurizing meat. 4,233,323, Cl. 426-55.000.

Swiss Aluminium Ltd.: *See*—
Schmidt, Walter, 4,233,270, Cl. 422-249.000.

Swiss Aluminum Ltd.: *See*—
Richter, Siegfried; and Vinkovic, Josef, 4,233,110, Cl. 156-656.000.

Syva Company: *See*—
Maggio, Edward T.; Wife, Richard L.; and Ullman, Edwin F., 4,233,402, Cl. 435-7.000.
Yoshida, Robert A.; and Maggio, Edward T., 4,233,401, Cl. 435-7.000.

Szczepanski, Henry; Rohr, Otto; Pissiotas, Georg; Bohner, Beat; and Rempfler, Hermann, to Ciba-Geigy Corporation. Phenoxyalkanecarboxylic acid derivatives, their production, herbicidal compositions containing them, and their use. 4,233,054, Cl. 71-70.000.

Szebenyi nee Gyori, Eniko; Kovacs nee Mindler, Vera; Redey, Laszlo; and Szemos nee Szonyi, Agnes, to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara R.T. Process for the preparation of 5-halo-6,9 α-oxido-prostaglandin derivatives. 4,233,121, Cl. 204-59.00R.

Szemos nee Szonyi, Agnes: *See*—
Szebenyi nee Gyori, Eniko; Kovacs nee Mindler, Vera; Redey, Laszlo; and Szemos nee Szonyi, Agnes, 4,233,121, Cl. 204-59.00R.

T. Y. Lin International: *See*—
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Tachiki, Hideo: *See*—
Ueda, Takeo; Fujita, Shinichi; Tachiki, Hideo; and Asano, Shuichi, 4,232,433, Cl. 24-230.00A.

Tada, Sugihiko; and Inukai, Yuzo, to Fuji Photo Film Co., Ltd. Process for the preparation of coupler dispersions. 4,233,397, Cl. 430-449.000.

Tada, Yutaka: *See*—
Eguchi, Wataru; Harada, Makoto; Tanigaki, Masataka; and Tada, Yutaka, 4,232,543, Cl. 73-15.00A.

Takahashi, Hirokazu: *See*—
Tashiro, Norio; and Takahashi, Hirokazu, 4,233,540, Cl. 315-39.510.

Takahashi, Izumi: *See*—
Moriki, Yasumitsu; Takahashi, Izumi; Sakurai, Masahiro; and Shimizo, Hidehiro, 4,233,487, Cl. 219-76.110.

Takahashi, Kihei; and Morita, Toyoo, to Yoshida Kogyo K.K. Method and apparatus for providing space sections in a continuous slide fastener chain. 4,232,438, Cl. 29-408.000.

Takahashi, Takeshi; and Yanagihara, Hiromichi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Internal combustion engine equipped with an auxiliary combustion chamber. 4,232,638, Cl. 123-260.000.

Takahashi, Toshihiko: *See*—
Kimura, Shoichi; Takahashi, Toshihiko; and Tamura, Zensuke, 4,233,275, Cl. 423-230.000.

Takahashi, Yukio; and Toyoda, Kazuhiro, to Fujitsu Limited. Electronic circuit for use in a digital circuit which prevents passage of pulses having a pulse width narrower than a predetermined value. 4,233,525, Cl. 307-234.000.

Takaku, Tetsuo: *See*—
Sakakura, Mitsuo; and Takaku, Tetsuo, 4,233,135, Cl. 204-192.0SP.

Takata, Mitsumune: *See*—
Ando, Momofuku; Minami, Junichi; Takata, Mitsumune; Ohnishi, Fumio; and Kawamoto, Shunichi, 4,233,327, Cl. 426-242.000.

Takeda, Makoto; Iwane, Hiroshi; and Hashimoto, Takashi, to Mitsubishi Petrochemical Co., Ltd. Novel hexahydrobenzopyran derivative and method of preparing the same. 4,233,226, Cl. 260-345.200.

Takei, Toshihiro: *See*—
Tsuge, Noboru; Kuwakado, Satosi; Takei, Toshihiro; and Shimogawa, Toshiaki, 4,232,886, Cl. 280-806.000.

Takematsu, Tetsuo; Konnai, Makoto; and Omokawa, Hiroyoshi, to Utsunomiya University. Novel benzenesulfonamide derivatives. 4,233,061, Cl. 71-103.000.

Takemoto, Toyoki; Komeda, Tadao; Yamada, Haruyasu; and Inoue, Michihiro, to Matsushita Electric Industrial Co., Ltd. Semiconductor integrated circuit device. 4,233,615, Cl. 357-22.000.

Takemura, Kazutoshi, to Riken Piston Ring Industrial Co., Ltd. Iron-base sintered alloy for valve seat and method of making the same. 4,233,073, Cl. 75-243.000.

Takeuchi, Takeshi; and Terasawa, Takao, to Hochiki Corporation. Connector for coaxial cables. 4,232,931, Cl. 339-258.00R.

Takeuchi, Tomio: *See*—
Nakayama, Yuya; Kunishima, Mamoru; Matsuda, Akira; and Takeuchi, Tomio, 4,233,224, Cl. 260-343.600.

Taki, Takamitsu: *See*—
Ikeda, Tadasu; and Taki, Takamitsu, 4,232,993, Cl. 415-103.000.

Tamarin, Bernard J.: *See*—
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Tamaru, Munetaka; Tsuzuki, Akira; Morokawa, Shigeru; Watanabe, Minoru; Kume, Kazunari; and Oono, Hideshi, to Citizen Watch Co., Ltd. Timepiece. 4,232,510, Cl. 368-28.000.

Tamura, Hifumi; and Ishitani, Tohru, to Hitachi, Ltd. Ion-electron analyzer. 4,233,509, Cl. 250-306.000.

Tamura, Masamitu; Yasuhara, Yukio; Nakamura, Shigeharu; Sakai, Masaru; Akagi, Kazuo; Kazihata, Ryohei; and Satohara, Norio, to Kobe Steel, Limited. Process for use in etching the outer surface of a metal member. 4,233,108, Cl. 156-639.000.

Tamura, Zensuke: *See*—
Kimura, Shoichi; Takahashi, Toshihiko; and Tamura, Zensuke, 4,233,275, Cl. 423-230.000.

Tanaka, Atsushi: *See*—
Mimura, Masahisa; Nakano, Isamu; Okawa, Nobuo; and Tanaka, Atsushi, 4,233,359, Cl. 428-254.000.

Tanaka, Kiichiro: *See*—
Okamura, Yasushi; and Tanaka, Kiichiro, 4,232,868, Cl. 274-9.00C.

Tanaka, Toshio; Otsu, Akira; Kurozumi, Seizi; and Wakabayashi, Toshio, to Teijin Limited. Novel 1-substituted-3-acylpyrrole derivatives, platelet aggregation inhibitors containing them, as active ingredients, and processes for production of said derivatives. 4,233,309, Cl. 424-270.000.

Tanigaki, Masataka: *See*—
Eguchi, Wataru; Harada, Makoto; Tanigaki, Masataka; and Tada, Yutaka, 4,232,543, Cl. 73-15.00A.

Tanigawa, Takeshi; and Yamauchi, Yukio, to Hochiki Corporation. Fire detection and observation system. 4,233,594, Cl. 340-525.000.

Tao, John C., to Air Products and Chemicals, Inc. Reactivation system for water-carbon dioxide adsorbers. 4,233,038, Cl. 55-33.000.

Tao, Ting C., to Incom International Inc. Air-oil separator. 4,233,042, Cl. 55-482.000.

Tashiro, Norio; and Takahashi, Hirokazu, to Tokyo Shibaura Denki Kabushiki Kaisha. Magnetron for microwave oven. 4,233,540, Cl. 315-39.510.

Tate, Edward D., Sr. Portable target raising and lowering device system. 4,232,867, Cl. 273-406.000.

Taylor, Rodney; Pragnell, Robert J.; and Sheppard, John P., to Coal Industry (Patents) Limited. Laminated insulating board. 4,233,357, Cl. 428-245.000.

Taylor, Stephen C., to Ford Motor Company. Radio for receiving and reproducing information broadcast on the intermediate frequency. 4,233,685, Cl. 455-151.000.

Taylor, William T. Selectively releasable overshot and pull tool. 4,232,894, Cl. 294-86.210.

TDK Electronics Company, Limited: *See*—
Saito, Shunjiro; Aue, Kazuhide; Kobayashi, Makoto; and Nakamura, Akio, 4,233,340, Cl. 427-125.000.

Teagan, W. Peter, to Arthur D. Little, Inc. Integral storage collector solar heating system. 4,232,656, Cl. 126-420.000.

Teague, Joe D.; and Wright, Paul J. Employing quicklime in stabilizing earth. 4,233,015, Cl. 405-263.000.

Teass, Horace A., Jr. Signal power coupling to rotary shaft. 4,232,922, Cl. 339-5.00R.

Technical Audio Products Corporation: *See*—
Nestorovic, Mioljub, 4,233,566, Cl. 330-59.000.

Technicon Instruments Corporation: *See*—
Pace, Salvatore J.; and Kumar, Anand, 4,233,144, Cl. 204-195.00B.

Tee-Pak, Inc.: *See*—
Burke, Noel I., 4,233,329, Cl. 426-277.000.
Tefertiller, Nancy B.; Burdett, Kenneth A.; and Harris, Robert F., to Dow Chemical Company, The. Addition polymerizable polyethers having pendant ethylenically unsaturated urethane groups. 4,233,425, Cl. 525-455.000.
Teichmann, Paul G.: *See*—
Beneke, Wolfgang; Teichmann, Paul G.; and Weber, Wilfried, 4,232,426, Cl. 19-106.00R.
Teijin Limited: *See*—
Hasegawa, Kinji; Mitsuishi, Yukio; and Masuda, Shigeyoshi, 4,233,354, Cl. 428-195.000.
Mimura, Masahisa; Nakano, Isamu; Okawa, Nobuo; and Tanaka, Atsushi, 4,233,359, Cl. 428-254.000.
Tanaka, Toshio; Otsu, Akira; Kurozumi, Seizi; and Wakabayashi, Toshio, 4,233,309, Cl. 424-270.000.
Teledyne, Inc.: *See*—
Altman, Norman G., 4,233,625, Cl. 358-101.000.
Teledyne Industries, Inc.: *See*—
Barbeau, Dennis E., 4,232,526, Cl. 60-745.000.
Telefonaktiebolaget L M Ericsson: *See*—
Dick, Willy P. A., 4,232,742, Cl. 169-58.000.
Terasawa, Takao: *See*—
Takeuchi, Takeshi; and Terasawa, Takao, 4,232,931, Cl. 339-258.00R.
Terrell, George C.; and Konnerth, Andrew, III, to Conservation Technologies, Inc. High efficiency hot water boiler. 4,232,634, Cl. 122-41.000.
Tertinek, Christian T.; and Stone, Alan J., to Stone Construction Equipment, Inc. Rotary power trowel. 4,232,980, Cl. 404-112.000.
Terzian, Rouben T., to Marvin Glass & Associates. Animated doll. 4,232,478, Cl. 46-141.000.
Teti, John J., to Pyott-Boone Machinery Corp. Battery plug and receptacle for use in mines. 4,232,930, Cl. 339-186.00M.
Tetra Pak Developpement SA: *See*—
Monaco, Jose R.; and Rausing, Hans A., 4,233,320, Cl. 426-7.000.
Tetra Pak International AB: *See*—
Ernstsson, Ernst G.; and Fuchs, Alfred, 4,233,271, Cl. 422-300.000.
Teutsch, Jean G.; and Philibert, Daniel, to Roussel Uclaf. 11β-Substituted-$\Delta^{4,9}$-estradienes. 4,233,296, Cl. 424-241.000.
Teutsch, Jean G.; and Deraedt, Roger, to Roussel Uclaf. Novel Δ^4-androstenes. 4,233,297, Cl. 424-243.000.
Texaco Development Corp.: *See*—
Nieh, Edward C. Y.; and Keating, Kenneth P., 4,233,447, Cl. 544-352.000.
Park, Jack H., 4,232,740, Cl. 166-276.000.
Texaco Inc.: *See*—
Allen, Joseph C., 4,233,166, Cl. 252-8.55D.
Arnold, Dan M., 4,233,508, Cl. 250-259.000.
Franklin, Barbara J., 4,232,739, Cl. 166-275.000.
Patterson, John A.; Crawford, Wheeler C.; and Wilson, James R., 4,233,244, Cl. 564-423.000.
Tyler, Timothy N.; and Carlin, Joseph T., 4,232,737, Cl. 166-273.000.
Textron Inc.: *See*—
Chmura, William J., 4,232,436, Cl. 29-148.40B.
Hsu, William W., 4,232,699, Cl. 137-87.000.
Johnson, Dwight N., 4,232,851, Cl. 251-61.100.
McGuire, Ned W., 4,233,099, Cl. 156-242.000.
Tharman, Paul A., to Briggs & Stratton Corporation. Connections for small engine auxiliary electrical system. 4,233,534, Cl. 310-71.000.
Thermatool Corp.: *See*—
Udall, Humfrey N., 4,233,484, Cl. 219-67.000.
Theurer, Josef, to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H. Mobile apparatus for laying railway track. 4,232,610, Cl. 104-3.000.
Thiel, Gerhard: *See*—
Rotzoll, Rudi-Heinz; Duffner, Paul; Dietl, Ernst; Pilz, Georg; and Thiel, Gerhard, 4,233,234, Cl. 260-501.200.
Thoma, Hans, to SIG Schweizerische Industrie-Gesellschaft. Spray-assisted pneumatic stone-working apparatus. 4,232,748, Cl. 173-3.000.
Thompson, Jack E., to Lilliston Corporation. Digger-shaker-inverter apparatus. 4,232,744, Cl. 171-101.000.
Thomsen, Ib. Detector for sensing the angular position of a rotatable magnet. 4,232,451, Cl. 33-361.000.
Thomson-CSF: *See*—
Lepere, Guy, 4,233,604, Cl. 343-7.0AG.
Thorn Automation Limited: *See*—
Whitlock, Reginald H., 4,233,529, Cl. 307-414.000.
Thune-Eureka A/S: *See*—
Eriksen, Gunnar, 4,232,435, Cl. 26-106.000.
Ticknor, William G.; and Rein, Arnold R., to American Can Company. Coextruded multilayer film. 4,233,367, Cl. 428-476.300.
Times Fiber Communications, Inc.: *See*—
Dabby, Franklin W.; and Chesler, Ronald B., 4,232,938, Cl. 350-96.200.
Timex Corporation: *See*—
Leibowitz, Marshall; Crandall, Richard; and Faughnan, Brian, 4,233,339, Cl. 427-108.000.
Schwarzschild, Jack, 4,233,679, Cl. 368-72.000.
Titus, Theodore, IV: *See*—
Bolick, Fred C., Jr.; Titus, Theodore, IV; and Mohammadioun, Said, 4,233,638, Cl. 360-92.000.
Tobin, Michael F.: *See*—
Shea, James M.; Tobin, Michael F.; and Anderson, Stanley E., 4,232,585, Cl. 91-432.000.
Toda, Kazuo; Hosoda, Tadashi; and Matsuo, Yutaka, to Mitsubishi Kinzoku Kabushiki Kaisha. Anode support member. 4,233,149, Cl. 204-297.00W.
Tojo, Tsutomu, to Olympus Optical Co., Ltd. Objective lens system for microscopes. 4,232,941, Cl. 350-175.0ML.
Tokai Denka Kogyo Kabushiki Kaisha: *See*—
Ohura, Osami; and Fujimoto, Osamu, 4,233,238, Cl. 260-513.700.
Tokiwa, Taisuke: *See*—
Hirayama, Kazuhiro; Sato, Yasushi; Tokiwa, Taisuke; Kawakubo, Kazuo; Iwatate, Fujio; and Nakatsui, Hisashi, 4,233,612, Cl. 346-160.000.
Kitamura, Takashi; Watanabe, Asao; Nakano, Takashi; Masaki, Katsumi; Hirayama, Kazuhiro; Sato, Yasushi; and Tokiwa, Taisuke, 4,232,954, Cl. 354-7.000.
Toko, Inc.: *See*—
Sakakura, Mitsuo; and Takaku, Tetsuo, 4,233,135, Cl. 204-192.0SP.
Tokuno, Masateru, to Rengo Kabushiki Kaisha (Rengo Co., Ltd.). Blank feeding apparatus. 4,232,859, Cl. 271-35.000.
Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Suzuki, Yasoji; Ochii, Kiyofumi; and Asahi, Hirozi, 4,233,672, Cl. 365-181.000.
Tashiro, Norio; and Takahashi, Hirokazu, 4,233,540, Cl. 315-39.510.
Tomaszewski, Lillie C., to Oxy Metal Industries Corporation. Electrolytic stripping bath and process. 4,233,124, Cl. 204-146.000.
Tomimori, Akinobu: *See*—
Hishinuma, Esao; Tomimori, Akinobu; and Hara, Hiroshi, 4,233,474, Cl. 179-81.00B.
Toppan Printing Co., Ltd.: *See*—
Sugawara, Kazuo; Sanada, Sei; and Kobayashi, Yosiharu, 4,233,663, Cl. 364-515.000.
Topps Chewing Gum, Incorporated: *See*—
Fritz, Douglas P.; and Elias, Ronald J., 4,233,319, Cl. 426-5.000.
Toray Industries, Inc.: *See*—
Ono, Masaaki; Okabe, Kazuo; and Miura, Yasuki, 4,233,352, Cl. 428-141.000.
Sato, Yoshiaki; and Arai, Hajime, 4,233,355, Cl. 428-224.000.
Senda, Teruo; and Otani, Mitsunobu, 4,233,159, Cl. 210-413.000.
Torbenson, Dale A. Machine for stripping shingles. 4,232,906, Cl. 299-39.000.
Toro Company, The: *See*—
Walto, Joseph J., 4,232,505, Cl. 56-12.700.
Torrington Company, The: *See*—
Bowen, Willard L., III, 4,232,914, Cl. 308-215.000.
Toshiba Kikai Kabushiki Kaisha: *See*—
Fujishima, Rikio; Nishihara, Kunisuke; and Hosoi, Hideo, 4,233,104, Cl. 156-504.000.
Tour & Andersson Aktiebolag: *See*—
Christiansen, Jorn U., 4,232,818, Cl. 236-46.00R.
Toyo Ink Manufacturing Co., Ltd.: *See*—
Katsura, Hiromitsu; Endo, Morihiko; and Kanno, Takashi, 4,233,206, Cl. 260-42.210.
Tsuchiya, Shozo; Hayashi, Hideo; Sasaki, Makoto; Goto, Kiyoshi; and Ihida, Kazuyoshi, 4,233,420, Cl. 525-310.000.
Toyo Pulp Co., Limited: *See*—
Hanaya, Morimasa, 4,232,720, Cl. 144-309.0AC.
Toyoda, Kazuhiro: *See*—
Takahashi, Yukio; and Toyoda, Kazuhiro, 4,233,525, Cl. 307-234.000.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Ochiai, Takeshi; Muto, Masahito; Sakakibara, Naoji; and Kawata, Shoji, 4,232,757, Cl. 180-176.000.
Sumiyoshi, Masaharu; and Motosugi, Katsuhiko, 4,232,517, Cl. 60-276.000.
Suzuki, Ichiro; Motonami, Masanao; and Ogawa, Hisashi, 4,232,885, Cl. 280-804.000.
Takahashi, Takeshi; and Yanagihara, Hiromichi, 4,232,638, Cl. 123-260.000.
Yamaguchi, Hiroaki; Hattori, Tadashi; Nishida, Minoru; Goto, Kenji; Sawada, Daisaku; and Shigematu, Takashi, 4,232,642, Cl. 123-416.000.
Traber, Walter: *See*—
Boger, Manfred; Drabek, Jozef; Mattern, Gunter; and Traber, Walter, 4,233,306, Cl. 424-263.000.
Tradall S.A.: *See*—
Vigna, Nicola, 4,232,795, Cl. 215-21.000.
Trambarulo, Ralph F.: *See*—
Carlson, Eric R.; Schneider, Martin V.; and Trambarulo, Ralph F., 4,233,579, Cl. 333-204.000.
Trane Company, The: *See*—
Lundblad, James T.; and Ware, Chester D., 4,232,533, Cl. 62-509.000.
Trecker, David J.: *See*—
Borden, George W.; Smith, Oliver W.; and Trecker, David J., 4,233,130, Cl. 204-159.230.
Treczka, Leo; and Spinner, Georg, to Spinner GmbH. Rotating coupler for transmitting high frequency energy. 4,233,580, Cl. 333-261.000.
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Smith, Edward F., Sr.; and Treesh, Lloyd N., 4,232,631, Cl. 119-52.0AF.
Trepte, Wulf, to Siemens Aktiengesellschaft. X-ray image detection apparatus. 4,233,516, Cl. 250-444.000.
Tridair Industries: *See*—
Warkentin, Roy, 4,232,496, Cl. 52-403.000.
Triram Corporation: *See*—
Jacobs, Melvin J., 4,233,356, Cl. 428-244.000.

Trummlitz, Gunter; Engel, Wolfhard; Seeger, Ernst; and Engelhardt, Gunther, to Boehringer Ingelheim GmbH. 4-Hydroxy-2H-1,2-benzothiazine-3-carboxamide-1,1-dioxides and salts thereof. 4,233,299, Cl. 424-246.000.

Trummlitz, Gunter; Seeger, Ernst; and Engel, Wolfhard, to Boehringer Ingelheim GmbH. 4,5-Dimethyl-thieno[3,2-d]isothiazolo-3(2H)-one-1,1-dioxides, compositions, and methods of use as a sweetener. 4,233,333, Cl. 426-548.000.

Trutzschler GmbH & Co. KG: *See—*
Beneke, Wolfgang; Teichmann, Paul G.; and Weber, Wilfried, 4,232,426, Cl. 19-106.00R.

TRW Inc.: *See—*
Miller, Laurence L., 4,232,708, Cl. 137-625.210.

Trzeciak, Kurt H., to Smith International, Inc. In-hole motor drill with bit clutch. 4,232,751, Cl. 175-101.000.

Tsipenjuk, Yakov I.: *See—*
Antipov, Georgy A.; Gelfand, Mikhail L.; Goldshtein, Boris G.; Rutgaizer, Mikhail I.; Suut, Nikolai K.; Tsipenjuk, Yakov I.; Shishulin, Jury P.; Galimov, Apas G.; Sutyagin, Oleg Y.; and Yankovsky, Oleg A., 4,232,750, Cl. 173-93.600.

Tsuboshima, Kosaku: *See—*
Sawamura, Ichiro; and Tsuboshima, Kosaku, 4,232,970, Cl. 356-432.000.

Tsuchihashi, Michihiro; Saito, Masato; Yamanoshita, Makota; Katsura, Hidetoshi; Myodo, Osamu; and Maeyama, Koichiro, to Mitsubishi Denki Kabushiki Kaisha. Method of lighting for colored shadows. 4,233,654, Cl. 362-231.000.

Tsuchiya, Shozo; Hayashi, Hideo; Sasaki, Makoto; Goto, Kiyoshi; and Ihida, Kazuyoshi, to Nippon Oil Co., Ltd.; and Toyo Ink Manufacturing Co., Ltd. Process for producing curable coating resins. 4,233,420, Cl. 525-310.000.

Tsuge, Noboru; Kuwakado, Satosi; Takei, Toshihiro; and Shimogawa, Toshiaki, to Nippon Soken, Inc. Tensioning device for seat belt. 4,232,886, Cl. 280-806.000.

Tsuguhiro, Fukuda: *See—*
Yoshio, Komaki; Shigehisa, Fukuda; Tsuguhiro, Fukuda; Noriaki, Nakao; Katsuhide, Suzuki; and Matsuo, Ishizuka, 4,232,895, Cl. 296-65.00A.

Tsuji, Koh, to Hitachi, Ltd. Centrifugal turbomachine. 4,232,994, Cl. 415-127.000.

Tsuji, Teruji: *See—*
Uyeo, Shoichiro; Yoshioka, Mitsuru; Tsuji, Teruji; Kikkawa, Ikuo; and Nagata, Wataru, 4,233,216, Cl. 260-239.00A.

Tsukada, Katsuo; and Ohnuma, Sadabumi, to Hitachi, Ltd. Liquid chromatography apparatus. 4,233,156, Cl. 210-101.000.

Tsukada, Toshihisa: *See—*
Yamamoto, Hideaki; Matsui, Makoto; Tsukada, Toshihisa; Eto, Yoshizumi; Hirai, Tadaaki; and Maruyama, Eiichi, 4,233,506, Cl. 250-227.000.

Tsunashima, Masaaki: *See—*
Slangan, Gary; and Tsunashima, Masaaki, 4,233,325, Cl. 426-107.000.

Tsuzuki, Akira: *See—*
Tamaru, Munetaka; Tsuzuki, Akira; Morokawa, Shigeru; Watanabe, Minoru; Kume, Kazunari; and Oono, Hideshi, 4,232,510, Cl. 368-28.000.

Tucker, James I., to Orion Industries, Inc. Alternative diameter gasket. 4,232,421, Cl. 16-2.000.

Tuda, Koji: *See—*
Nagashima, Hironobu; Tuda, Koji; and Marui, Masatoshi, 4,232,685, Cl. 128-773.000.

Tuke, Michael A.: *See—*
Samuelson, Kent M.; and Tuke, Michael A., 4,232,404, Cl. 3-1.910.

Tulaszewski, Olaf. Leg positioning device for X-ray filming. 4,232,681, Cl. 128-653.000.

Turndorf, Herman: *See—*
Chalon, Jack; Ramanathan, Sivam; and Turndorf, Herman, 4,232,667, Cl. 128-203.260.

Turner, Raymond, to Aquila Steel Company, Ltd. On-site modular support systems for supporting cables, conduit and the like. 4,232,845, Cl. 248-49.000.

Turner, S. Richard; Yanus, John F.; and Pai, Damodar M., to Xerox Corporation. Imaging system using novel charge transport layer. 4,233,384, Cl. 430-59.000.

Tuturea, David P.: *See—*
Chou, Frank S. F.; Tuturea, David P.; and Blight, Graham J., 4,232,623, Cl. 114-125.000.

Tuzson, John J., to Borg-Warner Corporation. Drive coupling. 4,232,770, Cl. 192-41.00R.

Twitchett, Peter J.; and Williams, Peter L., to National Research Development Corporation. Methods and apparatus for liquid chromatography. 4,233,030, Cl. 23-230.00R.

Tyler, Timothy N.; and Carlin, Joseph T., to Texaco Inc. Double tapered surfactant waterflood oil recovery process. 4,232,737, Cl. 166-273.000.

Uchida, Hiromichi. Device for binding a thermally adhesive tape to articles. 4,232,498, Cl. 53-76.000.

Uchigasaki, Isao: *See—*
Monma, Noboru; Maekawa, Iwao; Sarudate, Tutomu; Sato, Hidetaka; and Uchigasaki, Isao, 4,233,413, Cl. 525-168.000.

Uchiyama, Yasuji, to Nippon Gakki Seizo Kabushiki Kaisha. Automatic accompaniment apparatus. 4,232,581, Cl. 84-1.030.

Udall, Humfrey N., to Thermatool Corp. High frequency current welding of metal strip to a metal part. 4,233,484, Cl. 219-67.000.

Uddeholms Aktiebolag: *See—*
Karlsson, Stig A., 4,233,007, Cl. 425-7.000.

Uebayashi, Takeo: *See—*
Sato, Kunihiko; Urata, Tetsuro; Asamoto, Tetsuhiro; Asakawa, Kobun; Uebayashi, Takeo; and Kawano, Mitugi, 4,233,485, Cl. 219-69.00M.

Ueda, Takeo; Fujita, Shinichi; Tachiki, Hideo; and Asano, Shuichi, to NSK-Warner K. K. Seat belt buckle device. 4,232,433, Cl. 24-230.00A.

Ueno, Susumu: *See—*
Asai, Michihiko; Suda, Yoshio; Imada, Kiyoshi; Ueno, Susumu; and Nomura, Hirokazu, 4,233,419, Cl. 525-288.000.

Ulin, Roy A.: *See—*
Hof, Craig R.; and Ulin, Roy A., 4,232,552, Cl. 73-356.000.

Ullman, Edwin F.: *See—*
Maggio, Edward T.; Wife, Richard L.; and Ullman, Edwin F., 4,233,402, Cl. 435-7.000.

Ulrich, James A., to J. V. Manufacturing & Welding, Inc. Waste paper compacter with front access features. 4,232,599, Cl. 100-25.000.

Umemoto, Toshio: *See—*
Yoshikawa, Kenichi; Koshikawa, Makoto; Umemoto, Toshio; Satoh, Tetsuo; Ichikawa, Singo; and Kato, Yoshiaki, 4,232,512, Cl. 368-82.000.

Unibra: *See—*
Delmon, Bernard; and Van Houte, Ghislain, 4,233,175, Cl. 252-192.000.

Union Carbide Corporation: *See—*
Borden, George W.; Smith, Oliver W.; and Trecker, David J., 4,233,130, Cl. 204-159.230.
Fenner, Gary W.; and Ragi, Elias G., 4,232,728, Cl. 165-1.000.
Fiato, Rocco A., 4,233,466, Cl. 568-902.000.

Union Oil Company of California: *See—*
Miller, J. Wayne; and Anderson, Mark J., 4,233,034, Cl. 44-1.0SR.

Unit Rig & Equipment Co.: *See—*
Satterwhite, Charles R., 4,232,982, Cl. 405-179.000.

United Catalysts Inc.: *See—*
Atwood, Kenton; Wright, James H.; and Merriam, Jay S., 4,233,187, Cl. 252-466.00J.
Hausberger, Arthur L.; and Dienes, Edward K., 4,233,180, Cl. 252-373.000.
Russ, Karl J.; and Broughton, Donald R., 4,233,179, Cl. 252-373.000.

United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See—*
Gibson, Peter J., 4,232,570, Cl. 74-866.000.
Sobey, Arnold J., 4,232,844, Cl. 244-123.000.

United States Gypsum Company: *See—*
Baehr, Donald O.; and Izard, David G., 4,233,368, Cl. 428-538.000.
Kuhr, Albert F., 4,232,594, Cl. 98-40.00D.

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Administrator U.S. Environmental Protection Agency: *See—*
Pontius, Duane H.; and Smith, Wallace B., 4,233,037, Cl. 55-2.000.
Air Force: *See—*
Grakauskas, Vytautos, 4,233,249, Cl. 568-926.000.
Grakauskas, Vytautos, 4,233,250, Cl. 568-926.000.
Griffin, Warren R., 4,233,426, Cl. 525-477.000.
Shaheen, Joseph M., 4,233,103, Cl. 156-331.000.
Stoffer, Lewis J., 4,232,996, Cl. 416-191.000.
Woods, Don F.; and Larsen, Ronald F., 4,232,446, Cl. 33-143.00L.
America: *See—*
Driscoll, John S.; Khan, A. Hameed; and Chou, Feng-Te, 4,233,215, Cl. 260-239.0EQ.
Army: *See—*
Benson, Willard R., 4,232,607, Cl. 102-56.00R.
Ellis, James N., 4,233,554, Cl. 320-46.000.
Helbert, John N., 4,233,394, Cl. 430-270.000.
Commerce: *See—*
Johnson, Christian E., Sr., 4,233,107, Cl. 156-632.000.
Energy: *See—*
Emmett, John L.; Jacobs, Ralph R.; Krupke, William F.; and Weber, Marvin J., 4,233,570, Cl. 331-94.50F.
National Aeronautics and Space Administration; administrator; with respect to an invention of:
Chernoff, Ralph C. Frequency translating phase conjugation circuit for active retrodirective antenna array. 4,233,606, Cl. 343-100.0TD.
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St. Clair, Terry L., 4,233,258, Cl. 264-137.000.
Navy: *See—*
Brady, Jesse J., III, 4,233,678, Cl. 367-122.000.
Gaertner, Robert F., 4,233,558, Cl. 323-17.000.
Miller, Donald; and Skipton, Robert W., 4,232,417, Cl. 9-8.00R.
Rice, Roy W.; and Pohanka, Robert C., 4,233,477, Cl. 179-110.00A.

U.S. Philips Corporation: *See—*
Bouwhuis, Gijsbertus; and Hazerdonk, Teunis J., 4,233,502, Cl. 250-204.000.
Eggermont, Ludwid D. J., 4,233,684, Cl. 375-30.000.
Essers, Wilhelmus G., 4,233,489, Cl. 219-121.00P.
Gerritsen, Jan, 4,233,547, Cl. 315-368.000.
Harris, Jeffrey J.; and Wood, Colin E. C., 4,233,092, Cl. 148-175.000.
Hinz, Hans-Dieter; Rothgordt, Ulf; and Schinke, Franz, 4,233,385, Cl. 430-117.000.
Iemenschot, Johannes A., 4,232,870, Cl. 274-39.00R.

Jongerius, Hermanus M.; and van der Wolf, Rein W., 4,233,653, Cl. 362-84.000.
Kemner, Rudolf; and Cramer, Rudy R., 4,233,633, Cl. 358-221.000.
Klaassen, Francois M.; and Appels, Johannes A., 4,233,617, Cl. 357-23.000.
Kleis, Derk, 4,233,472, Cl. 179-1.0GA.
Mijnheer, Andries, 4,233,261, Cl. 264-293.000.
Oostvogels, Franciscus M. P.; Melis, Gustaaf; and Van Laarhoven, Aime P. A. M., 4,233,542, Cl. 315-73.000.
van de Spijker, Willebrordus H. M. M.; and Konijnendijk, Willem L., 4,233,538, Cl. 313-486.000.
Verdult, Josephus A.; and Manders, Lambertus W. J., 4,233,336, Cl. 427-67.000.

United States Steel Corporation: *See—*
Curtis, Omer E., Jr., 4,233,432, Cl. 528-298.000.

United States Surgical Corporation: *See—*
Veth, George J., 4,232,682, Cl. 128-671.000.

U.S. Terrazzo Panels, Inc.: *See—*
Murray, John A., 4,233,008, Cl. 425-77.000.

United Technologies Corporation: *See—*
Breault, Richard D.; Roethlein, Richard J.; and Congdon, Joseph V., 4,233,369, Cl. 429-26.000.
Goller, Glen J.; and Breault, Richard D., 4,233,181, Cl. 252-425.300.
Grudkowski, Thomas W., 4,233,573, Cl. 331-107.00A.

University of California, The Regents of the: *See—*
Hammel, Harold T.; and Maggert, James E., 4,233,153, Cl. 203-10.000.
Studer, Henry E., 4,232,506, Cl. 56-327.00R.

University of Illinois Foundation: *See—*
Anderson-Shanklin, Gene C., 4,232,687, Cl. 128-777.000.

University of North Carolina at Chapel Hill: *See—*
Statland, Bernard E.; and Sher, Geoffrey, 4,233,032, Cl. 23-230.00B.

University of Southern California: *See—*
Yen, Teh F.; and Farmanian, Paul A., 4,232,738, Cl. 166-274.000.

UNL Incorporated: *See—*
Sauer, Mark R., 4,232,962, Cl. 355-46.000.

Uozumi, Yukio, to Kawasaki Jukogyo Kabushiki Kaisha. Guided vehicle for guide-way transportation system. 4,232,611, Cl. 105-215.00R.

Upjohn Company, The: *See—*
Kelly, Robert C., 4,233,225, Cl. 260-345.200.

Uranerzbergbau GmbH: *See—*
Eresen, Nahit; Schroer, Klaus; and Becker, Hans J., 4,233,272, Cl. 423-7.000.

Urata, Tetsuro: *See—*
Sato, Kunihiko; Urata, Tetsuro; Asamoto, Tetsuhiro; Asakawa, Kobun; Uebayashi, Takeo; and Kawano, Mitugi, 4,233,485, Cl. 219-69.00M.

Urbain, Daniel, to Laminoirs a Froid de Thionville. Method of making metal-plastic ski. 4,233,098, Cl. 156-242.000.

USM Corporation: *See—*
Hollick, John G., 4,232,418, Cl. 12-61.00A.

Utsunomiya University: *See—*
Takematsu, Tetsuo; Konnai, Makoto; and Omokawa, Hiroyoshi, 4,233,061, Cl. 71-103.000.

Uyeo, Shoichiro; Yoshioka, Mitsuru; Tsuji, Teruji; Kikkawa, Ikuo; and Nagata, Wataru, to Shionogi & Co., Ltd. Azetidinone derivatives and production thereof. 4,233,216, Cl. 260-239.00A.

V & W Parts & Machine Shops, Inc.: *See—*
Fair, James V., 4,232,437, Cl. 29-156.40R.

Vaccari, Franco. Ski boots. 4,232,459, Cl. 36-71.000.

Vacuum Cleaner Corporation of America, The: *See—*
Cutler, Morris; and Tamarin, Bernard J., 4,232,837, Cl. 242-107.000.

Valantin, Alfred A. M., to Charbonnages de France. Carriage with articulated track. 4,232,911, Cl. 305-16.000.

Valayil, Silvester P.; and Elias, Moenes L., to Dart Industries Inc. Dissolution of metals utilizing an aqueous H_2SO_4-H_2O_2-3-sulfopropyldithiocarbamate etchant. 4,233,111, Cl. 156-666.000.

Valayil, Silvester P.; and Elias, Moenes L., to Dart Industries Inc. Dissolution of metals utilizing an aqueous H_2SO_4-H_2O_2-polysulfide etchant. 4,233,112, Cl. 156-666.000.

Valayil, Silvester P.; and Elias, Moenes L., to Dart Industries Inc. Dissolution of metals utilizing an aqueous H_2O_2-H_2SO_4-thioamide etchant. 4,233,113, Cl. 156-666.000.

Valentin, Guenter: *See—*
Hoerauf, Werner; Valentin, Guenter; Kegel, Robert; and Kuhn, Helmut, 4,233,429, Cl. 526-71.000.

Van Thiel's Draadindustrie (Thibodraad) B.V.: *See—*
van Thiel, Rudolphus A. F. J., 4,233,364, Cl. 428-399.000.

VanAllan, James A.: *See—*
Petropoulos, Constantine C.; Reynolds, George A.; and VanAllan, James A., 4,233,443, Cl. 542-454.000.

Van Coney, Robert H.: *See—*
Lucas, Malcolm B.; and Van Coney, Robert H., 4,233,017, Cl. 425-290.000.

Vandenende B.V.: *See—*
Steketee, Cornelis J., 4,232,743, Cl. 171-55.000.

van der Lely, Cornelis. Device for selectively applying liquid manure onto or into the ground. 4,232,616, Cl. 111-7.000.

van der Lely, Cornelis. Soil cultivating implements. 4,232,746, Cl. 172-59.000.

van der Lely, Cornelis. Device for spreading material. 4,232,831, Cl. 239-673.000.

van der Wolf, Rein W.: *See—*
Jongerius, Hermanus M.; and van der Wolf, Rein W., 4,233,653, Cl. 362-84.000.

van de Spijker, Willebrordus H. M. M.; and Konijnendijk, Willem L., to U.S. Philips Corporation. Luminescent lead-activated alkaline earth metal rare earth metal borates and mercury vapor discharge lamp containing the same. 4,233,538, Cl. 313-486.000.

Van Eenam, Donald N., to Monsanto Company. Wet strength polymers. 4,233,417, Cl. 525-359.000.

Van Houte, Ghislain: *See—*
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Van Laarhoven, Aime P. A. M.: *See—*
Oostvogels, Franciscus M. P.; Melis, Gustaaf; and Van Laarhoven, Aime P. A. M., 4,233,542, Cl. 315-73.000.

Van Pham, Minh. Pneumatic assisted flushing apparatus for toilets. 4,232,409, Cl. 4-362.000.

Van Siclen, Howard E., Jr., to Bendix Corporation, The. Control circuit for diesel injection system. 4,232,647, Cl. 123-478.000.

van't Hooft, Eric. Apparatus for internal irradiation. 4,233,517, Cl. 250-497.000.

van Thiel, Rudolphus A. F. J., to Van Thiel's Draadindustrie (Thibodraad) B.V. Anchoring fibre for use in concrete. 4,233,364, Cl. 428-399.000.

Variable Kinetic Drives Limited: *See—*
Hobbs, Howard F., 4,232,567, Cl. 74-677.000.

Varian Associates, Inc.: *See—*
Coad, George L., 4,233,519, Cl. 250-514.000.
Falce, Louis R., 4,233,539, Cl. 315-5.380.

Vaseen, Vesper A. Portable lung apparatus. 4,232,665, Cl. 128-200.240.

Vasile, Carmine F., to Rockwell International Corporation. Periodic magnet unidirectional transducer. 4,232,557, Cl. 73-629.000.

VDO Adolf Schindling AG: *See—*
Hahn, Joachim, 4,232,915, Cl. 312-107.000.
Sudler, Roland; Kupferschmidt, Peter; and Schwab, Jean-Francois, 4,233,680, Cl. 368-76.000.

Veach, Carlos W. Broken line drafting templates. 4,232,448, Cl. 33-174.00B.

Velsicol Chemical Corporation: *See—*
Kyker, Glendon D.; and Paul, Kalidas, 4,233,251, Cl. 570-220.000.

Ventura, Daniel S.: *See—*
Peterson, Robert R.; Ventura, Daniel S.; and Gureghian, Richard S., 4,232,563, Cl. 74-470.000.

Vepex Fovallalkozasi Iroda Rt: *See—*
Koch, Lehel, 4,233,210, Cl. 260-112.00R.

Verdicchio, Robert J.: *See—*
Lindemann, Martin K. O.; and Verdicchio, Robert J., 4,233,192, Cl. 252-545.000.

Verdult, Josephus A.; and Manders, Lambertus W. J., to U.S. Philips Corporation. Method of applying luminescent material to a glass support. 4,233,336, Cl. 427-67.000.

Vernaleken, Hugo: *See—*
Idel, Karsten; Vernaleken, Hugo; Freitag, Dieter; Reiff, Gunther; and Rudolph, Hans, 4,233,431, Cl. 525-462.000.

Verzwyvelt, Scott A.: *See—*
Lim, Hong S.; Rogers, Howard H.; and Verzwyvelt, Scott A., 4,233,347, Cl. 427-352.000.

Vesterlund, Gunnar, to AB Asea-Atom. Method for providing a diffusion barrier. 4,233,086, Cl. 148-6.300.

Veth, George J., to United States Surgical Corporation. Physiological parameter measuring system. 4,232,682, Cl. 128-671.000.

Vidal, Andre: *See—*
Boret, Roger; Bronner, Charles; Huin, Roland; and Vidal, Andre, 4,233,268, Cl. 422-190.000.

Videen, Otis R., to Conwed Corporation. Method and device for coloring bulk hydro mulch fibers. 4,232,480, Cl. 47-9.000.

Viennatone Gesellschaft m.b.H.: *See—*
Janovsky, Franz, 4,232,405, Cl. 3-12.300.

Vigna, Nicola, to Tradall S.A. Non-refillable bottle closure. 4,232,795, Cl. 215-21.000.

Vilshofer, Alfred: *See—*
Maude, John H.; Sterck, Lothar; and Vilshofer, Alfred, 4,233,264, Cl. 422-117.000.

Vinkovic, Josef: *See—*
Richter, Siegfried; and Vinkovic, Josef, 4,233,110, Cl. 156-656.000.

VIP Industries, Inc.: *See—*
Lichtenstein, Bernard; and Nemeth, Edward, 4,232,443, Cl. 29-753.000.

Viramontes, Jose A. B. Harvester with mechanical rod weeder and soil agitator. 4,232,745, Cl. 172-44.000.

Viscosuisse S.A.: *See—*
Weber, Werner; and Rustler, Hubert, 4,233,496, Cl. 219-390.000.

Visu-Flex Corporation: *See—*
Spees, Arthur T., 4,232,463, Cl. 40-373.000.

Vitek, John M.: *See—*
Smith, Warren F., Jr.; Vitek, John M.; and Shapiro, Eugene, 4,233,068, Cl. 75-157.500.
Smith, Warren F., Jr.; Vitek, John M.; and Shapiro, Eugene, 4,233,069, Cl. 75-157.500.

Vitukevich, Ronald: *See—*
Matson, Wayne R.; and Vitukevich, Ronald, 4,233,031, Cl. 23-230.00B.

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Ward, Gary A.: *See*—
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Waterbury, Nelson J. Reclosable container. 4,232,797, Cl. 220-359.000.

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Kitzing, Rainer; Scott, John G. V.; Webb, Terence C.; and Evans, Graham, 4,233,399, Cl. 430-510.000.

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Hruda, Robert M., 4,233,480, Cl. 200-144.00B.
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Williams, Francis R. Siphon. 4,232,694, Cl. 137-1.000.
Williams, Frank N., to Bradley Corporation. Basket strainer and stopper assembly for sinks. 4,232,407, Cl. 4-287.000.
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Winsor, Robert B., to IEC-Holden Ltd. Wall lining with attachment means. 4,232,612, Cl. 105-423.000.
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Zelina, Francis J., Jr.; and Zelina, John H., Jr., 4,233,655, Cl. 362-258.000.

Zelinger, Stanley H.: *See*—
Derby, Ronald C.; Zelinger, Stanley H.; Dampier, William P.; and Lazzara, Samuel P., 4,232,523, Cl. 60-641.000.

Zellweger Uster Limited: *See*—
Grunder, Werner; and Murbach, Erwin, 4,232,447, Cl. 33-147.00L.

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Baker, Roy F.; and Banach, Frank, 4,233,630, Cl. 358-167.000.
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Ziemecki, Stanislaw B.: *See*—
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Zolotenko, Vladimir A.: *See*—
Grachev, Konstantin A.; Berber, Viktor A.; Sokolov, Viktor E.; Pavlov, Vladimir V.; Popov, Alexei N.; and Zolotenko, Vladimir A., 4,232,967, Cl. 356-336.000.

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Zrenner, Christian: *See*—
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Zuhlke Engineering AG: *See*—
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Zumfeld, Heinz: *See*—
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Zundorf, Dieter: *See*—
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Zysman, Bernard K.: *See*—
Baumgardt, Walter G.; Ondesko, John J.; and Zysman, Bernard K., 4,233,203, Cl. 260-38.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 11TH DAY OF NOVEMBER, 1980

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

AMP Incorporated: *See*—
Davis, Thomas F., Re. 30,434, Cl. 106-1.220.

Brother Kogyo Kabushiki Kaisha: *See*—
Fukao, Satoshi, Re. 30,435, Cl. 200-159.00R.

Bussjager, Rudy C., to Carrier Corporation. Heat exchanger. Re. 30,433, Cl. 62-115.000.

Carrier Corporation: *See*—
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Davis, Thomas F., to AMP Incorporated. Electroless tin and tin-lead alloy plating baths. Re. 30,434, Cl. 106-1.220.

Fukao, Satoshi, to Brother Kogyo Kabushiki Kaisha. Keyboard switch arrangement and key switch useable therein. Re. 30,435, Cl. 200-159.00R.

Stoakes, Richard L. Structural assemblies. Re. 30,432, Cl. 52-395.000.

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Beitler, Myron: *See*—
Barner, Terry L.; Leer, Stuart D.; and Beitler, Myron, 257,512, Cl. D18-7.000.
Sereika, Joseph; and Beitler, Myron, 257,513, Cl. D18-7.000.

Berkman, Joseph L. Video-tape cabinet. 257,496, 11-11-80, Cl. D3-35.000.

Braun Aktiengesellschaft: *See*—
Ullmann, Roland, 257,520, Cl. D28-49.000.

Computer Automation: *See*—
Fow, Robert S.; Tooke, Michael H.; and Loosen, Ronald E., 257,509, Cl. D14-40.000.
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Dewees, John G.: *See*—
Franklin, Robert P.; and Dewees, John G., 257,497, Cl. D6-157.000.

Evan, Stephen J. Combined crab mallet set and support stand. 257,501, 11-11-80, Cl. D7-101.000.

Faux, Alfred W., to Homeware Industries Limited. Bicycle exerciser. 257,515, 11-11-80, Cl. D21-194.000.

Flambeau Products Corporation: *See*—
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Florists' Transworld Delivery Association: *See*—
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Fow, Robert S.; Tooke, Michael H.; and Loosen, Ronald E., to Computer Automation. Computer console. 257,509, 11-11-80, Cl. D14-40.000.

Fow, Robert S.; Tooke, Michael H.; and Loosen, Ronald E., to Computer Automation. Computer console. 257,510, 11-11-80, Cl. D14-40.000.

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Herman, John. Clip. 257,518, 11-11-80, Cl. D27-02.000.

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Loosen, Ronald E.: *See*—
Fow, Robert S.; Tooke, Michael H.; and Loosen, Ronald E., 257,509, Cl. D14-40.000.
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McIntosh, David S. Vehicle wheel. 257,507, 11-11-80, Cl. D12-211.000.

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Mixon, James A. Sewage treatment plant or the like. 257,516, 11-11-80, Cl. D23-3.000.

Olin Corporation: *See*—
Zahn, Hajo, 257,511, Cl. D15-139.000.

Owens-Illinois, Inc.: *See*—
Weckman, Richard L., 257,504, Cl. D9-408.000.

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CLASSIFICATION OF PATENTS

ISSUED NOVEMBER 11, 1980

NOTE.—First number, class; second number, subclass; third number, patent number

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